DARWIN
DIGITAL AUDIO DISK RECORDER

Operation Manual

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• FI466 Rev. B

IMPORTANT NOTICE:

IN ORDER TO OBTAIN WARRANTY SERVICE ON YOUR DARWIN UNIT, THE SERIAL NUMBER STICKER MUST BE INTACT AND YOU MUST HAVE A SALES RECEIPT OR OTHER PROOF OF PURCHASE. IF THERE IS NO SERIAL NUMBER STICKER ON DARWIN, PLEASE CONTACT E-MU SYSTEMS AT ONCE.

THIS PRODUCT IS COVERED UNDER ONE OR MORE OF THE FOLLOWING U. S. PATENTS: 3,969,682; 3,986,423; 4,404,529; 4,506,579; 4,699,038; 4,987,600; 5,013,105; 5,072,645; 5,111,727 AND FOREIGN PATENTS AND/OR PENDING PATENTS. DARWIN IS A REGISTERED TRADEMARK OF E-MU SYSTEMS, INC.

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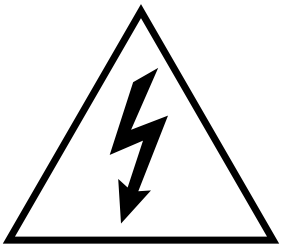
WARNING: READ THIS FIRST

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



This symbol is intended to alert the user to the presence of un-insulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

IMPORTANT SAFETY INSTRUCTIONS

Use in countries other than the U.S.A. may require the use of a different line cord or attachment plug, or both. To reduce the risk of fire or electric shock, refer servicing to qualified service personnel. To reduce risk of fire or electric shock do not expose this product to rain or moisture.

GROUNDING INSTRUCTIONS

This product must be grounded. If it should malfunction or break down, grounding provides a path of least resistance for electric current, reducing the risk of electric shock. This product is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet properly installed and grounded in accordance with all local codes and ordinances.

DANGER

Improper connection of equipment grounding conductor can result in the risk of electric shock. Check with a qualified electrician or service personnel if you are in doubt as to whether the product is properly grounded. Do not modify the plug provided with this product. If it will not fit the outlet, have a proper outlet installed by a qualified technician.

CAUTION

If the model 4000, 4001 or 4002 DARWIN is rack mounted, a standard 19 inch open frame rack must be used.

USER-MAINTENANCE INSTRUCTIONS

1. DARWIN should be kept clean and dust free. Periodically wipe the unit with a clean, lint free cloth. Do not use solvents or cleaners.
2. There are no user lubrication or adjustment requirements.
3. Refer all other servicing to qualified service personnel.

INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

WARNING; When using electric products, basic precautions should always be followed, including the following:

1. Read all instructions before using DARWIN.
2. To reduce the risk of injury, close supervision is necessary when DARWIN is used near children.
3. Do not use DARWIN near water — for example near a bathtub, washbowl, kitchen sink, in a wet basement, on a wet bar, or near or in a swimming pool.
4. DARWIN should be situated so that its location or position does not interfere with its proper ventilation.

5. DARWIN should be located away from heat sources such as radiators, heat registers, fireplaces, stoves, or ovens.
6. DARWIN should only be connected to a power supply of the type described in the operating instructions and as marked on the product.
7. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure of DARWIN through openings.
8. This DARWIN may be equipped with a polarized line plug (one blade wider that the other). This is a safety feature. If you are unable to insert this plug into the outlet, do not defeat the safety purpose of the plug. Contact an electrician to replace your obsolete outlet.
9. The power supply cord of DARWIN should be unplugged from the outlet when left unused for a long period of time.
10. This product, in combination with an amplifier and headphones and speakers, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate for a long period of time at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, consult an audiologist.
11. The product should be serviced by qualified service personnel when:

    A. The power supply cord has been damaged; or

    B. Objects have fallen, or liquid has been spilled into the product; or

    C. The product has been exposed to rain; or

    D. The product has been dropped or the enclosure damaged; or

    E. DARWIN does not operate normally or exhibits a marked change in performance.
12. All servicing should be referred to qualified service personnel.

SAVE THESE INSTRUCTIONS

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK
DO NOT REMOVE COVER.
NO USER-SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED PERSONNEL

RADIO and TELEVISION INTERFERENCE

The equipment described in this manual generates and uses radio-frequency energy. If it is not installed and used properly — that is, in strict accordance with our instructions - it may cause interference with radio and television reception.

This equipment has been tested and complies with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of the FCC rules. These rules are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that the interference will not occur in a particular installation, especially if a “rabbit ear” TV antenna is used.

If DARWIN does cause interference to radio or television reception, you can try to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.
- Move DARWIN to one side or the other of the television or radio.
- Move DARWIN farther away from the television or radio.
- Plug DARWIN into an outlet on a different circuit than the television or radio.
- Consider installing a rooftop antenna with a coaxial lead-in between the antenna and television set.

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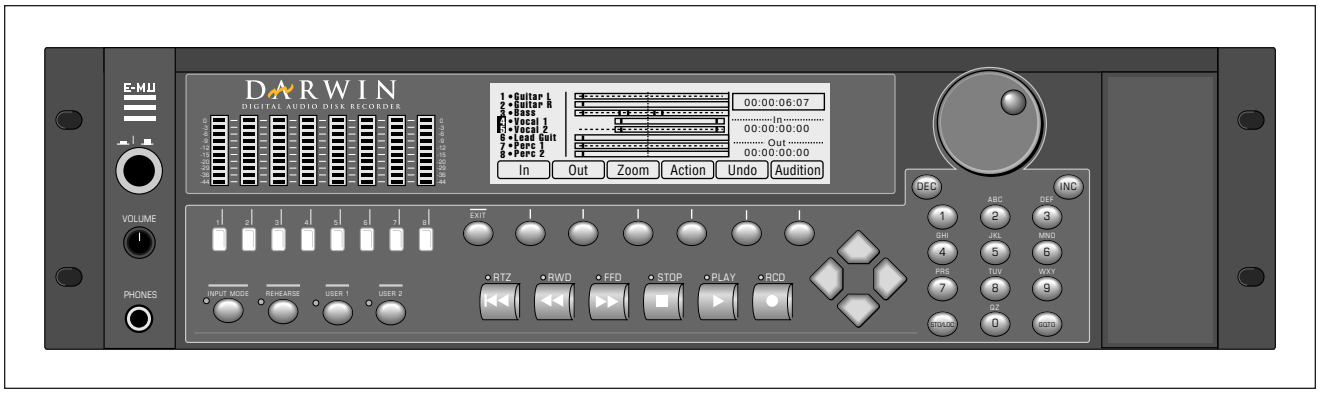
Introduction

Congratulations on purchasing a revolutionary product in the continually evolving world of digital audio. We thought by way of introduction we might share with you some of the history and motivations behind this exciting new product in E-mu's ever expanding array of technology for musicians.

We developed DARWIN for a couple of distinct reasons. First, it would only seem to make sense for the leader in digital sampling technology (that's us) to diversify into other areas of digital audio technology in order to help make life easier for you. As musicians, audio engineers, and sound designers just like you, we saw a distinct need for a truly random access, non-destructive disk recorder that works well alone and also integrates well into the project studio, i.e. it would connect and work well with popular sequencer packages, and be expandable such that it could be supplemented with a host computer to provide some more advanced DAW like features.

We also knew from direct experience how difficult it can be to learn some of the computer based DAWs, especially when you use your computer for something other than just digital audio. Because of this, we deliberately made DARWIN as solid and easy to use as possible, but also powerful. We hope you agree that we've achieved those goals.

In the coming years E-mu will introduce several more cost effective, powerful, and easy to use tools that break down the barriers between the initial artistic inspiration (like that killer hook that came to you in the middle of the night) and the final artistic product (like a CD). We look at our role as the folks who build expressways for the artist, and we hope you will find our roads fun, fast, and free of potholes. Thanks again and congratulations on your purchase of DARWIN.



DARWIN

DARWIN is a stand-alone hardware based, digital audio recorder featuring the power of random access recording/editing combined with the familiar user interface of a tape recorder. DARWIN delivers a host of powerful options that differentiate it from its tape-based predecessors. Random access recording technology has many advantages over tape, such as greater precision and non-destructive editing. Because of its synchronization capabilities, DARWIN can provide additional tracks and add random access recording/editing capabilities to tape-based systems.

The size of the hard disks connected to DARWIN governs the amount of available recording time. 1 gigabyte of hard disk space translates into about 200 minutes of music recorded on a single track.

Versions are powerful components of DARWIN's non-destructive editing environment which allows you to instantly create project copies which in turn may be used to audition edits - from re-arrangement of entire composition structures to minute finessing of individual events - without affecting original material. Versions may also be employed to create additional virtual tracks by digital bouncing, then reintegrating tracks back into original material. DARWIN's multiple layers of undo and redo provide you with a “safety net” during recording or punch-in, as any track recorded over intentionally or accidently may be instantly resurrected. 40 instant locate points per version provide you with additional precision and convenience during editing by eliminating shuttle time.

DARWIN features 4 balanced analog input jacks (1/4" TRS) and 8 balanced analog output jacks (1/4" TRS). The number of inputs may be increased to 8 with the addition of the Analog Input Expansion card. DARWIN also features S/PDIF digital input/output for those wishing to remain completely in the digital domain. A 50-pin SCSI port is provided to connect to external hard disk storage media. A full MIDI Machine Control implementation allows DARWIN to be remotely operated via MIDI. DARWIN can also be synchronized to a sequencer using MIDI Time Code.

DARWIN is also equipped with an internal 8 x 2 mixer with pan capabilities for creation of independent headphone mixes and level/pan control during internal bounces.

DARWIN is an extremely powerful and reliable recording instrument. We at E-mu Systems sincerely hope it will help you further your musical ideas.

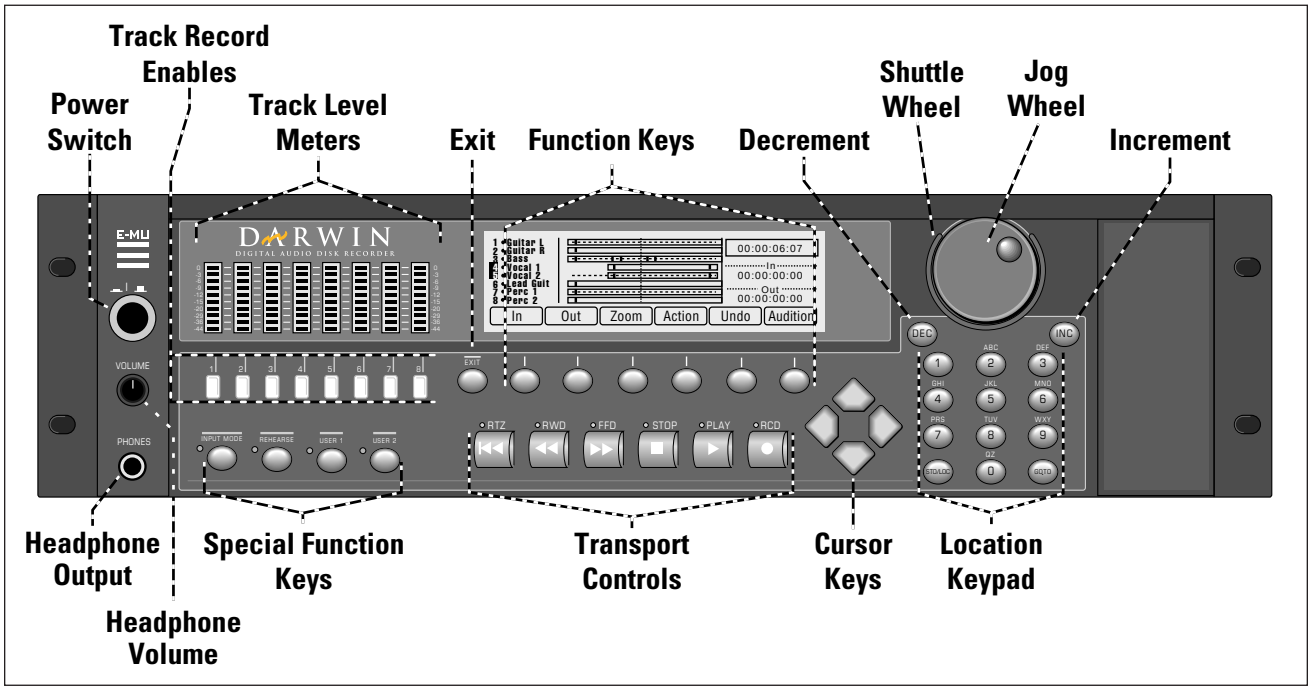
DARWIN Standard Features:

- **Non-destructive playlist style editing**
- **Audition Edit Mode**
- **Auto Input Punch Mode with Footswitch control**
- **Rehearse function**
- **40 instantly recallable Locate Points**
- **Up to 16 Layers of Undo/Redo**
- **Dedicated tape machine style controls**
- **10 segment VU Meters with peak hold**
- **Jog/Shuttle Wheel with tape machine like feel**
- **240 x 64 pixel LCD for graphic display of editing parameters**
- **MIDI Machine Control I/O and MIDI Time Code output**
- **Internal 8 x 2 mixer with pan facilities**
- **4 analog balanced audio inputs (TRS)**
- **8 balanced analog audio outputs (TRS)**
- **Selectable 44.1 kHz or 48 kHz sampling rates**
- **Switchable +4/-10 dB operation**
- **S/PDIF Digital I/O**
- **5 rear panel option slots**

DARWIN Optional Features:

- **Iomega Jaz Drive** *(1 Gigabyte removable media hard disk.)*
- **Analog Input Expander Card** *(Adds four additionl analog inputs.)*
- **ADAT Sync Option Card** *(Allows up to 16 DARWIN units to be synced together or interfaced with any ADAT compatible machine.)*
- **ADAT Optical Digital Card** *(Allows digital transfer of up to eight tracks between DARWINs or ADATs.)*
- **DSP Card** *(Adds gain change, fading and tapering, several types of pitch transposition and other digital signal processing functions.)*
- **SMPTE Card** *(Allows DARWIN to transmit and receive SMPTE timecode.)*

Main Controls



Power Switch

The switch is recessed when power is On to avoid an accidental power off. Don't switch power On and Off too fast. Wait 2 seconds.

Headphone Volume Output & Control

The headphone output is fed from the output of DARWIN's 8 x 2 submixer (located under Routing, Mixer). This headphone volume knob controls the headphone output level only. The eight track outputs are always output at full level (either -10 dBu or +4 dB).

Track Level Meters

10 segment, peak holding, bar graph meters which indicate the source and playback levels of each track. The topmost LED will continue to flash for two seconds when the level comes within 1.5 dB of clipping.

Tip: *The Track Record enable switches can also be used to "Mute" tracks when playing back audio, because they select either playback track and the input connected to that track.*

Track Record Enable/Monitor Keys

These keys flash when pressed to indicate that the corresponding track is in record standby mode. Recording will commence on any selected tracks when DARWIN is put into record mode using the transport controls. When a track is recording, the LEDs remain steadily lit.

Exit Key

The Exit key allows you to back out of a menu one menu at a time, each time the key is pressed. It can also be used anytime you do not want to execute a particular function.

Function Keys

The lower line of the display will usually contain a row of up to six "soft key" buttons. The soft-key in the display indicates the function of the function key (labeled F1-F6) directly below it.

Transport Controls

These buttons operate like familiar tape recorder controls.

Return to Zero (RTZ) jumps immediately to the programmed Project Start Time.

Fast Forward and Rewind move you at three different fast speeds through the project. A single press on the Fast Forward or Rewind key moves the transport at 5 times normal speed, The LED will be on continuously. Pressing the key again causes the LED to blink and the transport to move at 20 times normal speed. Pressing the key yet again causes the LED to blink rapidly and the transport to move at 100 times normal speed.

Stop (or FF/REW) immediately halts audio playback.

Play starts audio playback from the present position.

Record (when pressed in combination with Play) initiates recording on tracks that are record enabled.

Caution: *DARWIN will not go into Record mode if there is less than 1 MB of free memory on the hard disk or if the Event Usage becomes too high.*

Check the Version, Info window if Record mode stops working and you have disk memory remaining.

- *Reclaim memory to free up disk space.*
- *Bounce Tracks to clear events.*

To Record:

1. **Enable** one or more tracks using the **Track Record** keys. Their LEDs will flash.
2. Press and hold **Record**, then **Play**. Their LEDs will remain lit indicating that DARWIN is **Recording**.
3. Press **Stop** to end recording.

Special Function Keys

These keys are provided on the front panel for convenient access to Input Mode, Rehearse Mode, and the two User Assignable Keys.

Input Modes

- **Auto Input** (Input Mode LED On) You can monitor the recorded tracks until the time of punch-in. When recording is started, by front panel, MMC or footswitch command, any record enabled tracks begin recording and the record inputs are passed through to the outputs. When recording is stopped, the enabled tracks stop recording and the previously recorded parts of the tracks are again heard.
- **Normal Mode** You always hear the record enabled inputs regardless of whether DARWIN is recording or not.

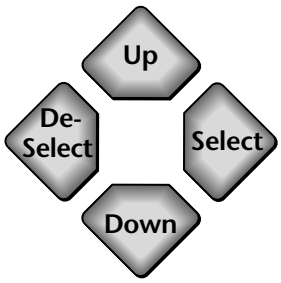
Rehearse Mode

(Rehearse LED On) This mode is designed to help you practice a punch in. It works just like input mode except that record is not enabled when the footswitch is pressed.

The Assignable Keys functions are not yet fully implemented in the initial software release. Did you send in your Warranty Card so we can notify you about software updates?

User 1 & 2

The functions of these keys are selectable from the System menu (AsgnKey). Currently however, the user keys have permanently assigned functions. User 1 auditions the selection and User 2 auditions the clipboard.



Cursor Keys

The left, right, up and down cursor keys are primarily used to move the cursor around in the display. The cursor is an area of inverted text or graphic in the display which indicates the currently selected parameter or item.

• In the Edit screen, the cursor keys take on the special function of selecting and de-selecting tracks to be edited. The right key selects the track, the left key de-selects the track and the up/down keys move the track selection cursor up and down.

Jog/Shuttle Wheels

The continuously variable **Jog Wheel** is located in the center of the spring-loaded outer **Shuttle Wheel**. The wheels are mainly used for precise positioning of the audio material, both forwards and backwards.

Caution: *When using the Shuttle Wheel at 2 times speed, DARWIN is not able to play all eight tracks. Only the first four tracks play at 2x speed. If you stop, then resume playing at a slower rate, the dropped tracks will return.*

The shuttle wheel controls the rate of audio playback from 1/10 to 2 times normal speed. The center jog wheel goes from very slow to normal speed. When searching for an edit point, the shuttle wheel is used to find a rough position and the center jog wheel can be used to "zero in" on the exact point. The **Play LED** blinks whenever the jog/shuttle wheels are in use. This is a useful feature when shuttling via MMC.

The jog/shuttle wheels can also serve as data entry controls whenever there are choices to be selected.

Inc/Dec Keys

The increment/decrement keys are used when a finer degree of control is required in selecting values. Increment increases the value by one each time it is pressed. Decrement decreases the value by one with each press.

In the Edit screen, pressing the Inc key moves you to the beginning of the project and pressing the Dec key moves you to the end of the project.

Numeric/Location Key Pad

The location keypad is used primarily to program and select locate points. **Pressing a location key will instantly select the location stored at that number.** The keypad is also used to enter numeric location values and for naming. Each key is also labeled "telephone-style" with 3 characters above it. Both upper and lower case characters are available on the labeled keys (as well as the number of the key). Press the key repeatedly until the desired letter appears.

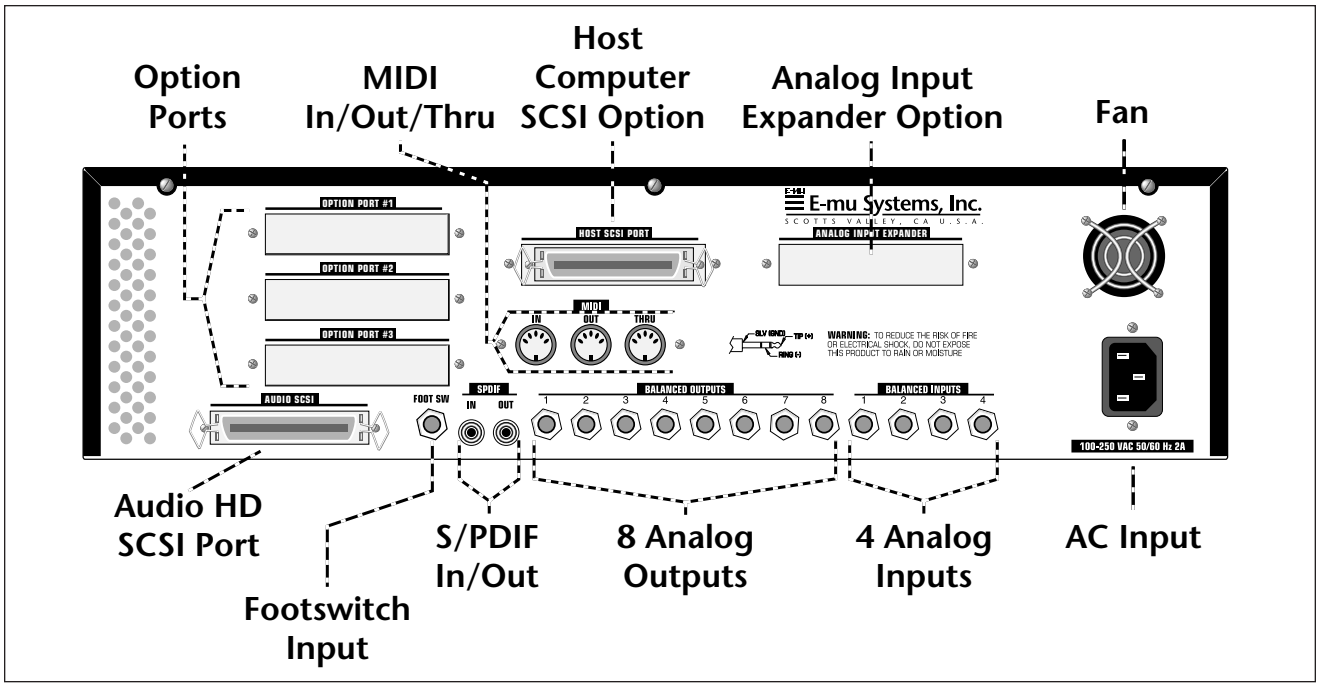
Store Locate Key

Stores the current location of the recorder at one of the ten key numbers. To store a location, press **STO LOC** and then one of the ten keys. Note: You cannot store a location while the transport is in Play or Record modes.

GoTo Key

Allows you to instantly jump to any location in the project. After pressing the key, the desired location can be entered using the jog/shuttle wheels, inc/dec keys and the cursor keys.

Connections



Option Ports
These three ports are designed to accept future expansion options such as an external synchronization card.

Audio SCSI
The Audio SCSI connector is a high-speed parallel interface which is used to interface DARWIN with external mass storage devices such as hard disks or tape drives for backup. The Audio SCSI port is where you connect the audio storage media.

For more information on SCSI installation, see, “Using SCSI” in the Reference Section of this manual. Also refer to the manual that accompanies your external SCSI device.

An initial setup section on page 15 contains step-by-step instructions on how to connect DARWIN to a SCSI device.

Footswitch Input
The footswitch input is used for punching in or out of record mode when one or more tracks are record-enabled. *See Punch-In, chapter 2*. When no tracks are record-enabled, the footswitch toggles back and forth between stop and play modes. The footswitch input accepts any **momentary** type of footswitch. The polarity of the footswitch (normally-open or normally-closed) is auto-sensed at power up.

S/PDIF In/Out
DARWIN provides a S/PDIF digital input and output for connection of DAT recorders or other digital equipment equipped with S/PDIF digital I/O. Keeping the signal in the digital domain is desirable to keep the signal to noise ratio as high as possible.

◩ *Always use high-quality, low capacitance, video grade cable with the S/PDIF digital interface to insure data integrity.*

S/PDIF In - Carries two tracks of digital audio which can be routed to any of DARWIN's eight tracks in the Routing module.

• IMPORTANT: When using S/PDIF In, BOTH cables (In & Out) must be connected to the DAT recorder and the DAT recorder must be set to External Clock. (Consult the operation manual of your DAT recorder for details.) The sample rates of the two machines should also match.

S/PDIF Out - Carries a stereo, digital mix of all eight tracks. DARWIN's 8x2 submixer controls the amount and panning of each track to the S/PDIF output.

MIDI Connections

DARWIN provides a MIDI IN, a MIDI OUT and a MIDI THRU port. Use cords that have been designed specifically for MIDI. While regular 5 pin DIN cords may work, they are not shielded correctly for MIDI use and may cause ground loops between equipment.

- The MIDI IN port connects to the MIDI OUT port of an external MIDI device such as a MIDI Machine Control (MMC) interface. This allows remote control of DARWIN via MIDI.
- MIDI OUT can be connected to a MIDI sequencer or computer, or to a MIDI Machine controller to implement a "closed-loop" between the two devices. DARWIN can also transmit MIDI Time Code (MTC) to a sequencer in order to synchronize digital audio tracks with MIDI sequencer tracks.
- MIDI THRU simply re-transmits any information received at the MIDI IN port.

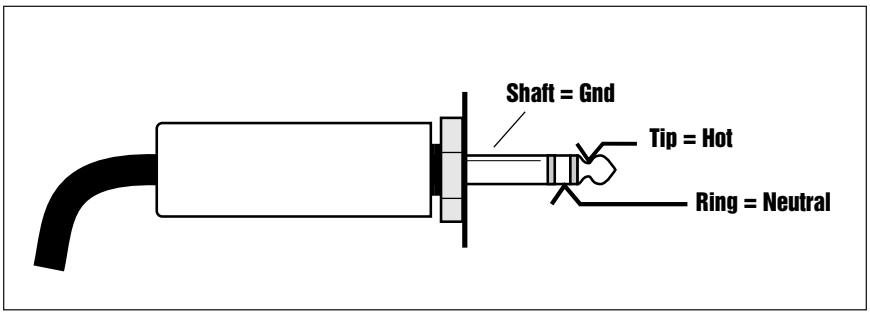
• Some mixers (such as the Mackie 1604) have alternate channel busses which can be conveniently connected to analog inputs 1 and 2 of DARWIN. By selecting the "two buss" preset (located under Routing, Preset) inputs 1 and 2 will be routed to all eight channels of DARWIN. Input 1 will be connected to odd numbered channels (1,3,5,7) and input 2 will be connected to all even numbered channels (2,4,6,8).

Analog Outputs:

DARWIN contains 8 balanced audio track outputs which are designed to be connected to a mixer. The levels of the 8 channel outputs are normally controlled by the faders on your mixer. The level of the analog outputs can be programmed to be +4 or -10 dB (selected in the routing screen). When unbalanced cables are used, the level is reduced by 6 dB. Output impedance is low.

Analog Inputs

DARWIN contains four balanced analog inputs (eight with the optional input expander). These are normally connected to the channel access outputs of your mixer. The level of the analog inputs can be programmed to be +4 dB or -10 dB (selected in the routing screen). Input impedance is high.



This diagram shows how DARWIN's balanced TRS outputs (and inputs) are wired.

Host Computer SCSI Option

This optional board allows a personal computer to be connected to enable graphic waveform display, editing of the recorded audio and the use of advanced DSP tools. Consult your dealer for more information.

Analog Input Expander Option

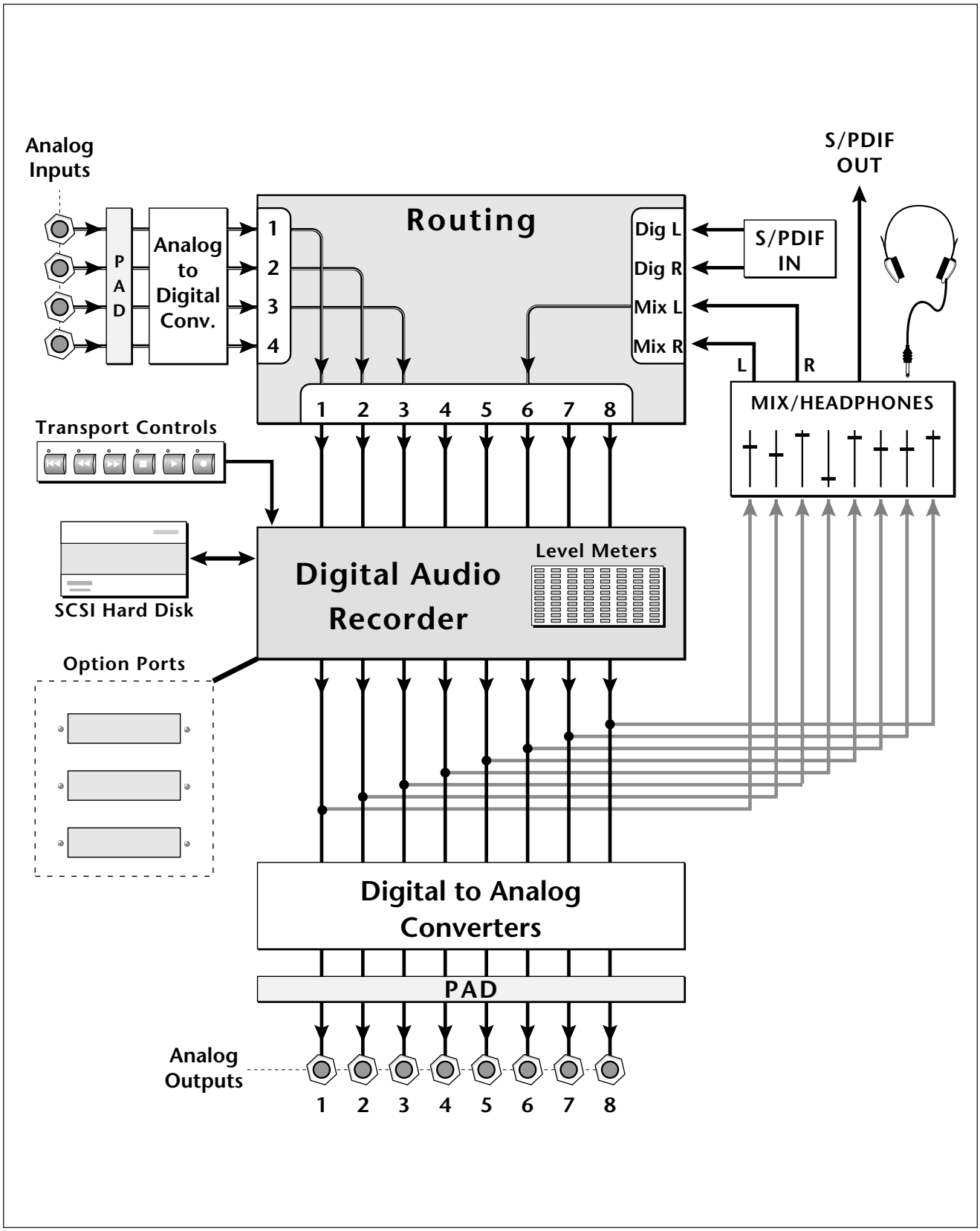
This optional board adds 4 additional analog inputs so that up to eight tracks can be recorded at once. Four additional inputs automatically become available in the Routing screen upon installation of the expander.

AC Power

DARWIN may be used in environments ranging from 100 volts to 240 volts, at either 50 Hz or 60 Hz. No change of voltage settings is required.

DARWIN automatically switches itself for the proper line voltage.

DARWIN Block Diagram



DARWIN Signal Flow

Input

A signal connected to one of the analog inputs of DARWIN passes through the PAD which matches the gain of the input to accommodate either -10 dB or +4 dB signal levels. The analog signal is next converted to digital by the Sigma/Delta ADCs and the digital signals fed to the Routing section.

Routing Section

The routing section is analogous to a patchbay where the inputs, located on either side of the routing screen are connected to any of the eight track inputs of the hard disk recorder at the bottom of the screen. Four analog inputs are provided (eight with the optional input expander) on the left side of the routing screen. Two channels of S/PDIF digital input and the outputs of the submixer are on the right side of the routing screen. Like the analog inputs, these input sources can also be routed to any of the eight tracks. There are several factory programmed routings (1->8, 2->8, 4->8, 8->8, & ADAT) and one user programmable routing. The eight channel output of the router feeds the eight input, internal submixer as well as the inputs to the recorder.

Submixer

The stereo output of the submixer drives the stereo headphone jack, and the S/PDIF output. In addition, the stereo submix outputs, called MIX L & MIX R in the routing screen, feed back as inputs to the router so that several tracks can be submixed and bounced down into one or two new tracks. Submixing is performed entirely in the digital domain to preserve sonic integrity.

Digital Audio Recorder

The recorder is controlled by familiar tape recorder controls (Stop, Play, Fast Forward, Rewind, Record, and Return to Zero), as well as the eight Record Enable buttons. Editing of recorded material is accomplished using the soft key menus under Edit. The Audio SCSI disk drives, which store the digital audio data, interface here.

Digital to Analog Converters

The eight outputs of the digital audio recorder are fed to the digital to analog converters and then through the output pad which outputs the signal at either a -10 dB or +4 dB level (as programmed in the routing section). The eight outputs of DARWIN are normally connected to inputs of your mixer.

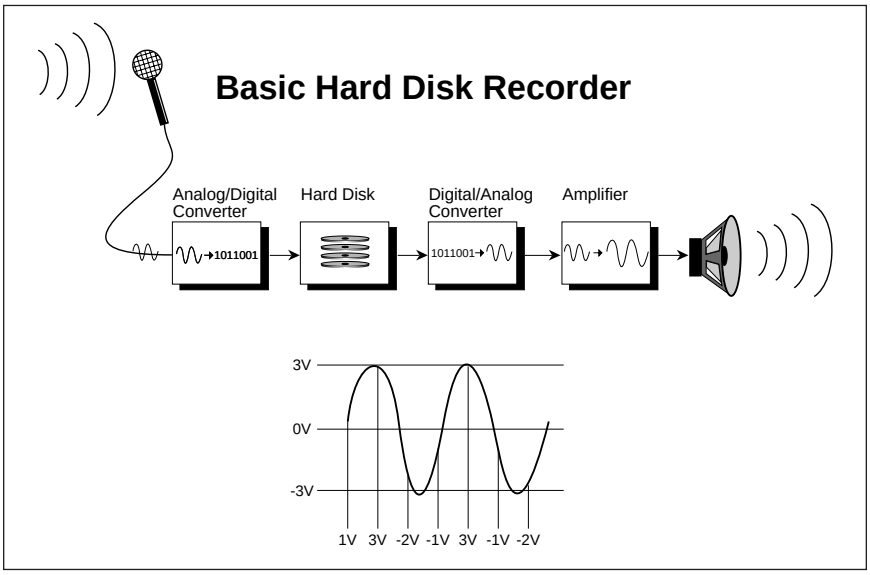
Digital Recording

DARWIN is conceptually like a tape recorder. However, the recording process is very different since DARWIN digitally records directly onto a SCSI hard disk drive.

Computers can accept information only in the form of numbers, so DARWIN accepts audio signals coded into binary numbers. Digital audio recorders work by examining (sampling) the incoming signal level at a very high rate (44,100 times a second for compact discs), and sequentially recording these different levels on the hard disk. Once stored, these samples may be played back (in the proper sequence, of course) to reconstruct the original signal. For instance, if a two-second sound was being recorded at 44.1 kHz, it would require (2 X 44,100) or 88,200 samples to be recorded. Since each sample is 16 bits or two bytes, the two second sound would require 176,400 bytes of hard disk space (2 x 44,100 x 2).

DISK USAGE: *DARWIN uses 5,292,000 bytes per track minute at the 44.1 kHz sample rate.*

8 tracks use 42,336,000 bytes per minute at the 44.1 kHz sample rate.

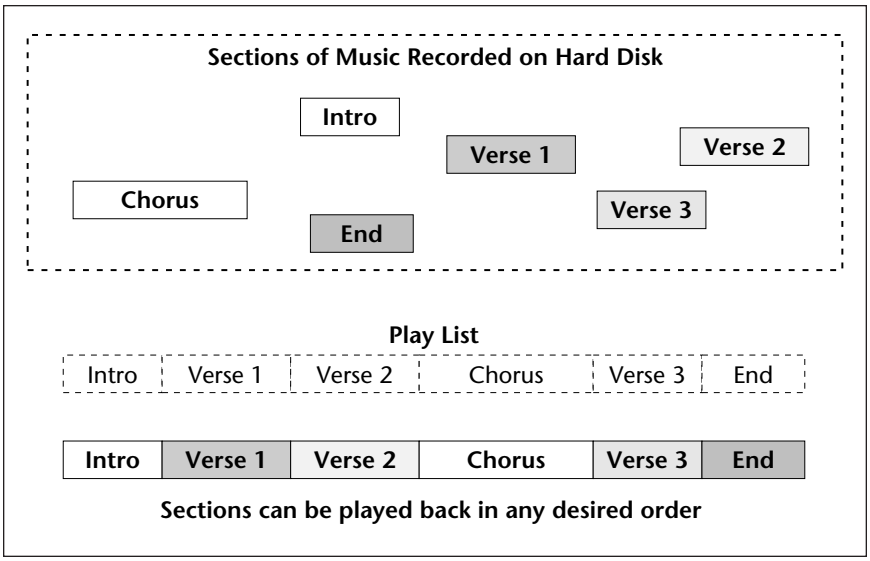


DIGITAL RECORDING *The signal is repeatedly measured at a high rate and the measurements are stored as digital numbers on a hard disk drive. Upon playback, the measurements are converted back into voltages in the proper order to reconstruct the original waveform.*

DARWIN can record and play back at a sample rate of either 44.1 kHz or 48 kHz. The higher the sampling rate, the more accuracy and the higher the frequency response, but the hard disk is also used up faster. 44.1 kHz is generally used when the project's destination will be a compact disc. Using the correct sample rate eliminates the need for sample rate conversion when transferring your project.

Hard Disk Recording

In hard disk recording, digital numbers representing the music are stored on a hard disk rather than on tape. Because hard disks use a retrieval process called **Random Access**, DARWIN is able to retrieve sections of music stored at various places on the disk and put them together in any desired order. This allows you to take sections of a song and rearrange them in order to try out different arrangement or to repair a flubbed part – all this without modifying the original data!



Recording music into DARWIN creates a **Project.** If you wanted to try another arrangement, you could create a new **Version**, which keeps the data intact but allows you to create another unique play list.

Connecting DARWIN to an External, Unformatted Hard Disk

A project must reside on a ***single hard disk drive***, so be sure to use a large capacity hard disk with enough room to hold your project.

1. Position the SCSI device and DARWIN in a stable location. Hard disk drives are particularly susceptible to shock and vibration. Make sure that you position your hard disk where it won't be bumped or moved while in use.
2. **IMPORTANT:** Make sure that all power to DARWIN and the SCSI device is turned OFF.
3. Connect the SCSI device to your DARWIN using a quality SCSI cable. Make sure that the connectors are firmly mated and that the wire "keepers" are locked in place. There are two type of SCSI cables in common use: the 50-pin Centronics type and the 25-pin DB connector type. DARWIN uses the Centronics type connector.
4. Set the SCSI ID of your external SCSI device to any number other than 0 or 7. (0 is the ID of the internal drive, if any; 7 is the default ID of DARWIN itself). Consult the operation manual of your SCSI device for this procedure.
5. Turn on the external SCSI device.
6. Apply power to DARWIN. The unit should power up normally.
7. Format the hard disk. Press the **System** function key (F1), then press the **Disk** function key (F1). Use the left/right/up/down cursor keys to select the desired hard disk. Press the **Format** function key (F1 again) to access the format menu. The display warns you that you are about to erase ALL files. Press the **Yes** function key (F5) to confirm. Formatting takes just a second.

Caution: *NEVER connect or disconnect the SCSI cable while power is applied to either the DARWIN or the SCSI device. Doing so may cause serious damage.*

Caution: *Use only high quality SCSI cables! Don't chintz out! Cheap cables have only some of the pins wired and may not work.*

Caution: *When 2 devices have the same ID, DARWIN will produce a "Disk Interface Timeout" message and will not work.*

Also, if a device is on the SCSI bus with the same ID as Darwin (fixed at ID 7), the disk browser will report ALL IDs as on line until the problem is corrected.

Definitions

Throughout this manual we will use the terms and concepts described and defined below. Read through this section carefully, even if you don't retain it all. You can refer back periodically as you read through the manual until you understand the basics and definitions.

How DARWIN is Organized

Sure, you're anxious to get started—but the following is a necessary part of learning how to use DARWIN. It is important to understand how DARWIN is organized in order to make best use of the machine in the shortest possible time. Many terms will be introduced now that show up later in the manual.

DARWIN is organized into six main menus. A menu controls a particular set of functions in DARWIN.

- **System:** Contains utilities and functions that affect the entire machine such as disk utilities, MIDI modes, and clock setting.
- **Routing:** Controls the routing of inputs to tracks within DARWIN. Also contains the internal submixer used for bouncing tracks and creating a headphone mix.
- **Project:** Allows you to create, open, rename, delete or copy projects as well as set a start point.
- **Version:** You can create, select, rename or delete the different versions of your projects. In this menu you can also give each track a name or reclaim memory by discarding undos.
- **Edit:** This menu allows you to completely rearrange your project or make minor repairs such as removing a flubbed note. Sections of tracks can be selected, then copied, cut, erased, inserted, extended, reversed or moved.

Activating a Menu

To work with a menu, you must first activate it. Press the function key associated with the desired menu.

Function Key Menus

Menus are selected using the "function keys" along the bottom of the display. Pop-up menus may also be used when a field being edited has a small number of choices.

Internal Drive

A hard disk drive is a memory storage device that stores data. However, other types of devices, as described later, can also connect to DARWIN to provide permanent sound storage.

- **1 GB Hard Disk Drive**: DARWIN Model 4001 comes with an internal 1 GB hard disk. Treat the DARWIN and its internal hard disk with care, just as you would any other hard disk drive.
- **1 GB Iomega Jaz® Drive**: DARWIN Model 4002 comes with a front panel mounted Jaz removable media disk. You can record dirctly to the jaz drive or use it for fast backup.

External Drives

DARWIN has an Audio SCSI (Small Computer Systems Interface) connector on the rear panel. This interface is commonly used in the computer industry, so many devices made to work with computers—particularly mass storage devices—will also work with DARWIN. Here are some of the types of mass storage devices that can plug into the DARWIN's SCSI connector.

- **Hard Disk Drive:** A hard disk provides the advantages of high memory capacity and fast access time. You cannot remove a hard disk and replace it with another one—the disk is a permanent part of the drive. There are three main cautions involved with hard disks:

1. Hard disks are sensitive to extreme mechanical shocks. If your hard disk falls off a stand, chances are the hard disk will be damaged.
2. Make sure power is not interrupted when you write data to the hard disk.
3. Hard disks have reached a very high level of reliability. However, they can fail from time to time (as can any part of a computer), so any data should be backed up periodically on some other medium.

Minimum Drive Specs for DARWIN

- Rotation Speed ≥ 5400 RPM
- Access Time ≤ 12 mS
- No Thermal Calibration/Embedded Servo design.

Caution: *Power up the SCSI DAT drive FIRST and wait a second or two before powering up DARWIN.*

- **SCSI DDS Tape Drives:** These are similar to audio DAT recorders using the same type of tape and a helical scan record/playback head. This is probably the best way to backup and archive your projects because of the low cost of the tapes themselves, typically around $10.00 - $20.00 for high quality tape as opposed to around $100.00 for other types of media. **DO NOT RELY ON A SINGLE TAPE FOR YOUR BACKUP!** All magnetic media is vulnerable to corruption. **Always make at least two backups of any important work!**

- **Removable-media Hard Disk Drives:** These are similar to normal hard disk drives except that the disk itself can be removed and replaced with another disk. Disk densities can range from 44 Mbytes to over 1 Gbyte per cartridge. Although many removable-media hard disk drives are too slow to be used as the primary drive, they are perfect for backups and are also quite handy for transferring projects between machines.

- **Magneto-Optical Drive:** Typically a magneto-optical drive can hold upwards of 300 Mb per side and the removable cartridges can be used over and over. Most Magneto-Optical drives are currently too slow to be used for recording, but they make good project backup drives.

Additional Definitions

Crossfade
On DARWIN you have the option to set the crossfade time at the beginning and end of audio events to prevent abrupt changes in signal level which are heard as clicks and pops. Crossfades use up more internal Events (see below), but are very important when performing editing functions. The Editing Preferences, located under System, allows you to set the crossfade time to suit the type of operation you are performing.

Cursor
The cursor is an inverted area of the display which indicates the currently selected item or value. The cursor keys allow you to move the cursor up, down, left , or right in a graphical display.

Event
Every time you do a punch-in, punch-out or any edit function, you add **Events** to DARWIN's internal playlist. DARWIN allows approximately 2000 Events per Version. Typically one user action creates several internal events. The 2000 event limit corresponds to about 50 punches on all 8 tracks with crossfade or 150 punches with crossfade turned Off. If you are working on complex projects with multiple punch-ins and edits, you need to be aware of the number of Events you are creating so that you don't run out of event memory. You can monitor the event usage from the Version, Info window. **Bouncing tracks makes a single event out of a highly edited track to allow additional recording and editing.**

Now Line
This is a vertical dotted line in the center of the editing screen which indicates the present time shown in the display.

Project
A project is a song or piece of music. You can have as many projects as will fit on your hard disk. There is a limitation in that a project MUST reside on a single hard disk. A large project cannot de divided among several disks. **The total time for a project cannot exceed 12 hours.**

Selecting
When the instructions say to select an option, you can use whatever method is most comfortable for you: the Jog/Shuttle wheels, the Increment/Decrement keys, or the numeric keypad (if applicable). Some functions do not implement all these options; you can’t go wrong by trying, though. If a function doesn’t respond to the numeric keypad, for instance, then pressing the keypad will have no effect. Use the data entry control or the Inc/Dec keys instead.

Version
You may have several different arrangements or versions of the same recording. Each version is a separate entity and does not affect the original recordings. Because different versions of a project normally use the same audio data, versions take up very little hard disk space.

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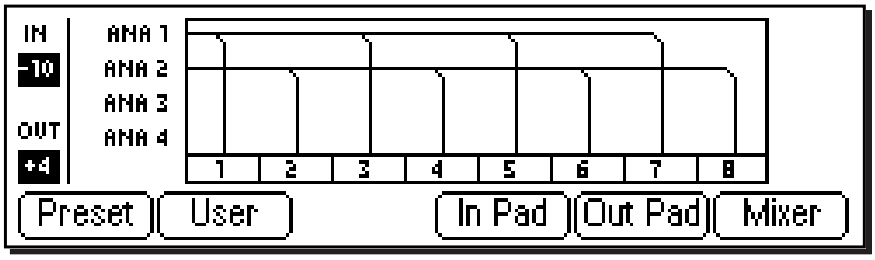
▶ Before you begin… Make sure that you have DARWIN connected to your mixer as described in the General Instructions section. DARWIN's eight outputs can be connected to eight inputs on your mixer. DARWIN's analog inputs can be connected to the channel outputs.

RECORDING

You probably already know how to record with DARWIN since it works just like a normal tape recorder.

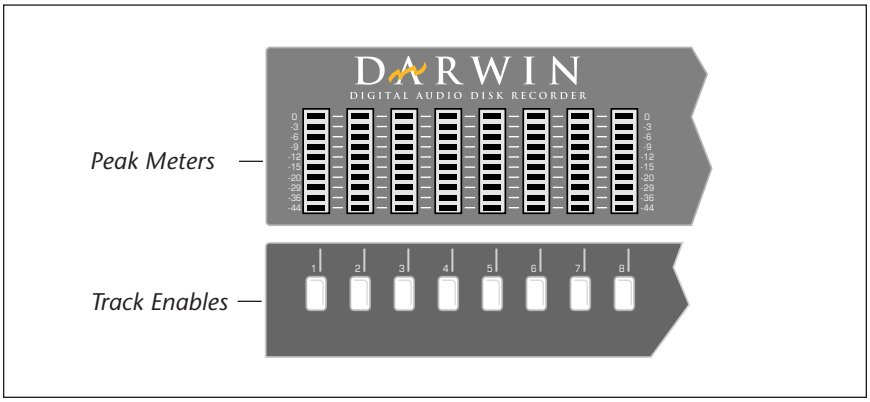
▶ Set the Input Routing

The Routing module determines which inputs are sent to what tracks. The analog sources are shown on the left side and the 8 track inputs are at the bottom of the window. The digital inputs and the mixdown sources are shown on the right side of the window (User setting only). In the example below, the *2-buss* preset routing has been selected, which connects analog inputs 1 and 2 to all eight tracks. The connections between the inputs and tracks are represented by lines.



▶ Enable Tracks

1. While in the routing screen shown above, **Press the Track Record Enable Buttons** corresponding to the tracks you have just connected. In the example above, you could record enable tracks 1 and 2 (or 3 & 4, or 5 & 6, or 7 & 8, or all of them for that matter). Each pair is connected to analog inputs 1 & 2. The track record enable buttons will begin flashing when pressed and the corresponding peak meter above will reflect the signal level at the input.



▶ Set the Input Pad

Feed the signal you plan to record through the mixer into DARWIN and verify that the Peak Meters are showing a signal. Press the **In Pad** function key (F4). The signal strength will either get stronger or weaker. The Input pad setting will toggle between -10 to +4. Choose the gain setting that works best when your mixer is set near unity gain (0dB). Press **Exit** to return to the main screen.

Tip: *On longer recordings, DARWIN may take a little time to do its "Housekeeping" when you stop recording. This time can be reduced by setting the Crossfade Time to zero in the System, Editing menu.*

▶ To Record

1. Press the **Track Record Enable buttons** corresponding to the tracks that you want to record on. Tracks enabled for recording will flash red.
2. Press the Return to Zero transport control ⏮ if you wish to begin at the project start time.
3. Hold **Record**, then press **Play**. The record and play LEDs will remain lit indicating that DARWIN is recording.
4. Press **Stop** to stop recording. The Record and Stop LEDs will flash quickly for a few seconds after recording while DARWIN organizes its files for the recording.
5. If you want to start over, repeat steps 2 through 4.

Caution: *DARWIN will not go into Record mode if there is less than 1 MB of free memory on the hard disk or if the Event Usage becomes too high.*

Check the Version, Info window if Record mode stops working and you have disk memory remaining.

- *Reclaim memory to free up disk space.*
- *Bounce Tracks to clear events.*

• DARWIN automatically keeps your Record Takes (or outtakes). The exact number of takes that are kept is determined by the number of Undo Levels set in the System, Editing menu.

• **Record-Abort** allows you to instantly erase the take, but there is no way to retrieve the take once it has been aborted.
To **Record-Abort**: Press and hold **Record**, then press **Stop**.

Punching In and Out

Punching In is the act of enabling recording while in play mode. Punching In is usually used to re-record a specific part in the middle of a song without having to play the whole song over. Say you have a guitar part recorded, but you're not happy with one of the solo parts. Rather than re-record the entire track, you can simply punch in over the solo and re-record just that one part.

• To use the punch-in feature, you may want to have a momentary footswitch (such as the E-mu SW332) connected to the footswitch input on the back panel. Turn on power to DARWIN with the footswitch connected. This allows DARWIN to sense the type of momentary footswitch you have connected (Normally-open or Normally-closed).

DO NOT use a footswitch that mechanically latches in the open or closed position.

• **Auto Input Mode** (Input Mode LED On)
Auto Input mode allows you to listen to the recorded tracks before and after punch-in, but automatically switches to the input during the punch in period. You're monitoring the recorded tracks, and the time comes to punch-in and so you hit the footswitch. Now you're monitoring the input channel. Hit the footswitch to punch-out and you're monitoring the previously recorded parts again. With Auto Input Off, you would be monitoring your input the whole time.

• **Rehearse Mode**
Rehearse mode works just like auto input mode in that it allows you to listen to the recorded tracks before and after punch-in, but automatically switches to the input during the punch in period. In Rehearse mode, however, DARWIN never actually goes into record mode. Rehearse mode allows you to practice your punch-in before actually recording.

▶ To Punch In Using the Front Panel Controls

1. **Press the Track Record Enable** buttons corresponding to the tracks that you want to record on. Tracks enabled for recording will flash red.
2. **Press the Input Mode key**, illuminating the LED, if you want to use this feature *(see Auto Input Mode above)*.
3. **Set the point at which you want to begin** using the transport controls, autolocate points or jog/shuttle wheels.
4. **Press Play** when you want the project **to begin** playing.
5. **Press Record, then Play** when you want to **Punch-In**. The Record LED is illuminated. If Auto Input mode is On you will hear your input during punch-in.
6. **Press Play** when you want to **Punch-Out**. The Record LED goes off. If Auto Input mode is On, you will hear the previously recorded tracks again after about two seconds.
7. **Press Stop** when you are ready to stop. The Record and Stop LEDs will flash for a moment while the file system is put in order, then the Stop LED will remain on.

▶ To Punch In Using the Footswitch

1. **Press the Track Record Enable** buttons corresponding to the tracks that you want to record on. Tracks enabled for recording will flash red.
2. **Press the Auto Input** key, illuminating the LED, if you want to use this feature *(see Auto Input Mode above)*.
3. Set the point at which you want to begin using the transport controls, autolocate points or jog/shuttle wheels.
4. **Press the Footswitch** once when you want the project **to begin** playing. If Auto Input mode is On you will hear the previously recorded tracks.

5. **Press the Footswitch** again when you want to **Punch-In**. The Record LED is illuminated. If Auto Input mode is On you will hear your input during punch-in.
6. **Press the Footswitch** again when you want to **Punch-Out**. The Record LED goes off. If Auto Input mode is On you will hear the previously recorded tracks again.
7. **Press the Footswitch** again to **Stop**. The Record and Stop LEDs will flash for a moment while the file system is put in order, then the Stop LED will remain on.

▶ To Undo a Recording

There are several ways to Undo a recording if you flub it:

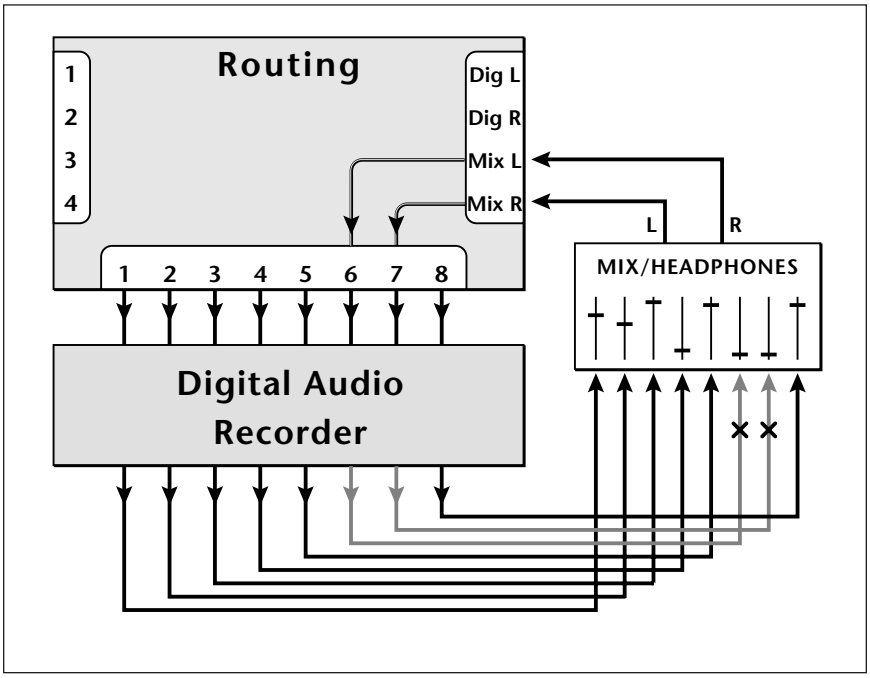
1. **RECORD ABORT - Press and Hold Record, then press Stop.** The recording is terminated and not logged. There is no chance to undo or recover the recording after a Record-Abort.
2. **RE-RECORD - Press Stop, Return to Zero, Record-Play, Play.** Essentially you just re-record over the tracks. Your previous takes are saved up to your Undo Level.
3. **UNDO - Press Stop, Edit, Undo.** Undo your recording, then re-record. This method saves memory, but takes more time.

Bouncing Tracks

Bouncing tracks is the act of re-recording a mix of several tracks onto one or two new tracks. Bouncing tracks frees up those tracks to be used again. Because DARWIN bounces tracks entirely in the digital domain, tracks can be submixed and bounced down with no reduction in audio quality.

• **EVENT LISTS** - Another important reason to bounce tracks is to eliminate all the edit points you have made in your tracks. As you make edits (punch-ins, punch-outs, cuts, copies, etc.), you add to DARWIN's **Event List**. If too many events are created, the hard disk may not be able to access the data fast enough and an error message may appear. You may also be prohibited from making any more changes to the audio data. When tracks are bounced down, their event lists are erased.

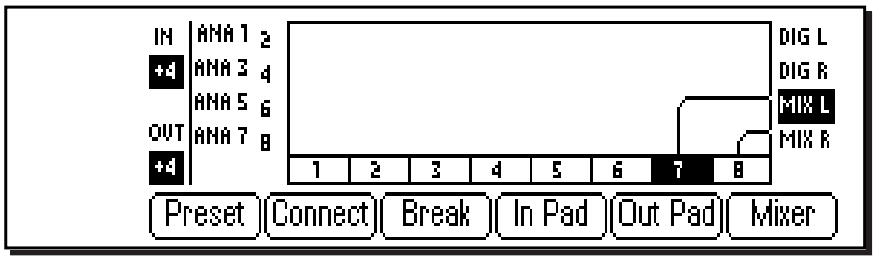
*Important Note: Whenever you bounce tracks using the submixer, a two sample delay is added to the bounced tracks. Although two samples is not much of a delay, it can cause phase problem if the bounced tracks are remixed with undelayed version of themselves. To counteract this delay, set the Clock display mode to display samples and use the **Move** edit function to move the tracks -2 samples.*



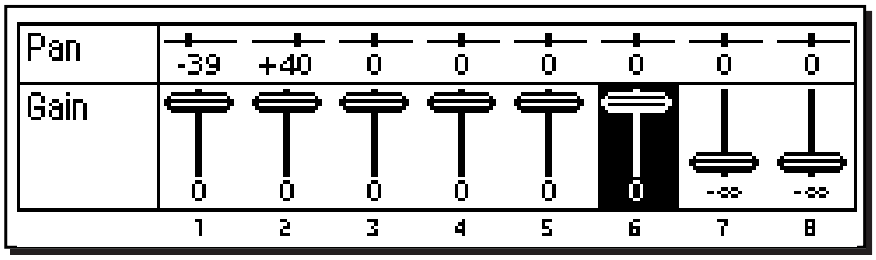
Tracks are bounced or re-recorded onto other tracks using the Routing screen. Do not submix tracks back into themselves. In the diagram above, faders 6 & 7 should be all the way down.

▶ To Bounce Tracks

1. Press the **Routing** function key (F2) from the main screen. The Routing screen shown below will appear.



2. Connect the outputs of the mixer to the tracks you want to bounce to. If you want to bounce to only one track, connect only one of the outputs.
3. Press the **Mixer** function key (F6). The Mixer screen shown below will appear.



4. Set the levels and pan positions of the tracks you wish to bounce using the cursor keys, numeric keypad, inc/dec keys and jog/shuttle wheels. Use the headphone output to monitor your mix.

DO NOT feed back tracks into themselves when bouncing as this will cause noise and distortion. Set the attenuators on tracks that you are bouncing **TO** at -∞ (minus infinity).

Tip: *You may want to go into the Edit menus so you can use the audio data bars as a reference point.*

5. Return the transport to zero, enable the tracks you are bouncing to and begin recording (Record-Play, Play). You're bouncing tracks!

Editing - A Guided Tour

Editing on DARWIN really is easy. After a little practice, you'll be editing like a pro. Follow along on this guided tour to get hands-on experience. With DARWIN's multiple undo levels, you don't have to worry about ruining a good take. It's automatically backed up.

▶ Before you Begin

Record some music with mistakes to fix. If you make a mistake while recording, play the part again until you get it right. You can cut out the mistake later with DARWIN! If you are working with a piece of music you want to keep intact, create another Version of it first. Your edits will only affect the new version.

One of the tricks to getting perfect edits is the judicious use of crossfade. Crossfade is set in the System menu under Editing. A time of 15 to 30 milliseconds provides a nice smooth crossfade which helps mask the edit point. Adjust the crossfade time depending on the material.

As long as you're in the System - Editing menu, set the number of Undo Levels to four or more. This will allow you to go back and try again, and again…and again…and again.

▶ Cutting Out a Mistake

You will often encounter problems where you want to remove extra rests or a flubbed note. This is just the fix.

1. Press **Edit** from the main screen. The editing window will appear.
2. **Select the tracks** you wish to edit using the cursor keys. The Up/Down keys select the track, the Right key selects a track and the Left key de-selects a track.
3. Press **Play** and listen for the mistake. When you find it, **Stop** and go back using the spring-loaded **Shuttle Wheel**.
4. Use the center **Jog Wheel** to zero-in on the part you want to cut. Use the **Zoom** key (F3) to magnify the graphic display.
5. Select the **In** and **Out** points. You can set the In and Out points in any order.
6. Press the **Action** function key (F4), then choose **Cut** (F2) from the menu. Cut removes the selected section (placing it on the clipboard) and moves the remaining audio to fill the gap, crossfading at the splice point.
7. If you are not happy with the resulting Cut, go to the Undo menu and Undo the Cut. Readjust the In/Out points and Cut again. Repeat steps 5 and 6 until the Cut sounds the way you want it.

Tip: *In a piece of music where the rhythm is continuous, you may want to use the Erase function instead of Cut.*

▶ Copy and Insert

Using these two functions you can copy an entire section, then repeat it by Inserting it back into the song.

1. Press **Edit** from the main screen. The editing window will appear.
2. **Select the tracks** you wish to edit using the cursor keys. The Up/Down keys select the track, the Right key selects a track and the Left key de-selects a track.
3. Press **Play** and listen for the section or phrase you want to duplicate. When you find the beginning of the section, **Stop** and go back using the spring-loaded **Shuttle Wheel**.

Tip: *Audition Selection can also be accessed using User Key 1.*

4. Use the center **Jog Wheel** to zero-in on the part you want to cut. Use the **Zoom** key (F3) to magnify the graphic display.
5. Select the **In** point. Repeat the procedure to find the **Out** point.
6. Press the **Audition** function key (F6), then press **In…Out** (F2). This function (Audition Selection) allows you to preview the section you have just selected.

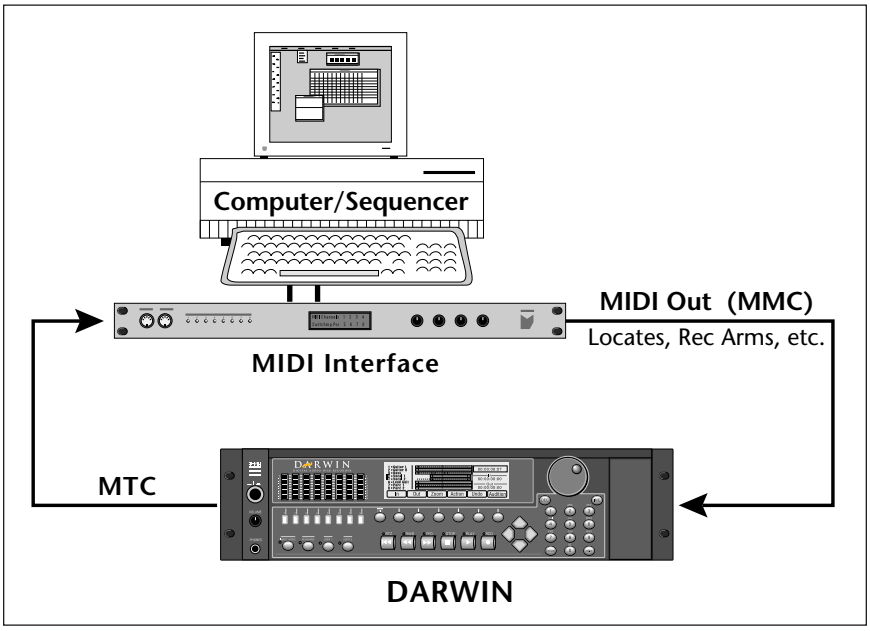
Tip: *Press the **Stop** button to abort the audition.*

7. If the section is not exactly right, go back and adjust the In and Out points as needed using the jog wheel. Repeat steps 6 and 7 until you've got it.
8. Press the **Action** function key (F4), then choose **Copy** (F1) from the menu. Copy makes a virtual duplicate of the section and places it on the clipboard. The original data is unaltered.
9. Find the spot where you want to Insert the section using the transport controls and Jog/Shuttle wheels.
10. Select the **In** point which determines exactly where the section will be inserted.
11. Press the **Action** function key (F4), then choose **Insert** (F3) from the menu. This will move the audio data forward to make room for the section on the clipboard and insert the section into the opening, crossfading at the splice points for a seamless join.
12. If you are not happy with the results, press the **Undo** function key (F5), then press **Undo**.

This operation is a little trickier than a simple Cut, but keep trying until you get it just right. Editing on DARWIN takes a little practice (but not that much, really). It's easy.

Synchronizing with a Sequencer

At the time of this writing, DARWIN must be the Master Device in any situation requiring synchronization. DARWIN sends MIDI Time Code, but does not read it. DARWIN does accept MIDI Machine Control commands such as, Record, Play, Pause, etc. and so can be easily interfaced with a computer based sequencer to work in perfect sync. The diagram below shows the basic setup.



Refer to the manuals for your sequencer for the exact way to set up MIDI Machine Control.

1. If you are using OMS or FreeMIDI, you need to **Set up a New MMC device** (DARWIN).
2. **Activate MMC and MTC record**. Both Performer & Vision assume MTC sync when you enable MMC.
3. **Turn On MTC Out** in DARWIN. **MMC Mode - Closed Loop.** (System-> MIDI menu.)

How it Works

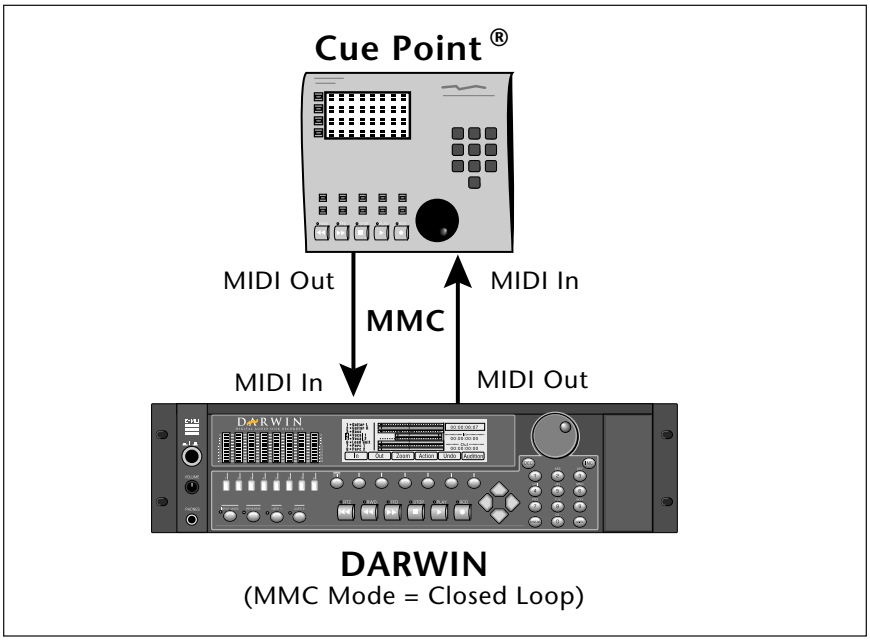
DARWIN and the sequencer are both controlled by the sequencer transport controls. When you press **Play**, the sequencer puts itself into play, but waits for the external clock. The MMC Play command is simultaneously sent out to DARWIN. On receiving the MMC play command, DARWIN begins playing and sends MIDI Time code back to the sequencer which starts and tracks in perfect synchronization.

Connecting an MMC Remote Controller

Refer to the Cue Point® operation manual for instructions on setting it up.

A MIDI Machine Remote Controller such as the J. L. Cooper Cue Point® can be used as a remote control for DARWIN. The Cue Point can control the track record enables, the transport controls and can shuttle backwards and forwards.

The diagram below shows how the system should be connected.



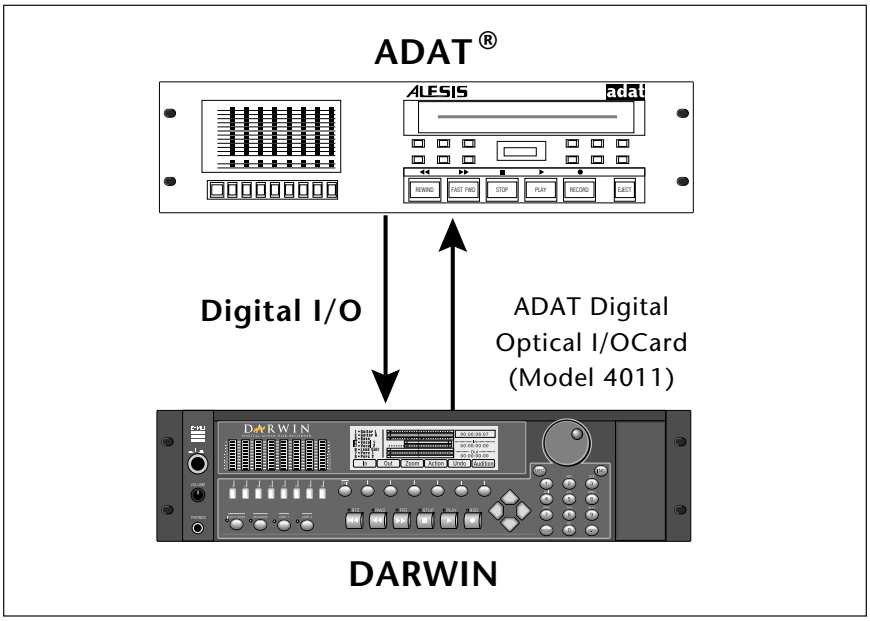
Setup

1. Set **MMC Mode** in DARWIN to **Closed Loop**. (System -> MIDI menu)
2. Set up the remote controller according to the instructions in its own operation manual.

USING THE ADAT® OPTICAL DIGITAL INTERFACE
(without the ADAT sync card)

Tip: *If you have an ADAT Sync Card installed, see the Optical Digital Interface operation instructions on page 38.*

The optional ADAT Optical Interface card (Model 4011) allows digital transfer of audio between DARWIN and the Alesis ADAT. Although the two units will be sample synchronized during the transfer, there is no timecode sync without the ADAT Sync card. You have to manually start the record and play processes.



FIRST - Select the ADAT routing in the Routing menu on DARWIN.

VERY IMPORTANT CONNECTION INSTRUCTIONS

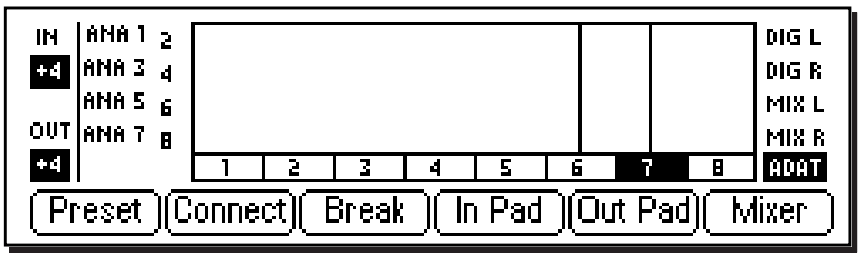
1. BOTH optical cables MUST be connected between the two units.
2. The ADAT must be set to receive an EXTERNAL digital clock source. Press and hold SET LOCATE then press the DIG IN button on the ADAT. The display will change to read, “dig”.
   - **On the ADAT XT** - press CLOCK SOURCE repeatedly until “48k Digital” appears in the display.
3. On the standard ADAT, press the DIG IN button again on the ADAT, lighting the LED.

OTHER IMPORTANT POINTS

1. If there is an ADAT BRC in the system, it must be turned Off or its sync output disconnected before turning on the ADAT.
2. You can transfer from DARWIN into the ADAT at 44.1 kHz, but you must set the ADAT to 44.1 kHz first. To select 44.1 kHz rate, use the ADAT pitch control and set it to -147 cents. The display will momentarily change to 44.1.
3. **Selecting input monitor on both DARWIN and the ADAT may result in digital feedback** which can be destructive to your monitor speakers.

▶ To Route an ADAT Channel to a Track:

1. From the Routing screen, use the up/down cursor keys to select the ADAT input.



2. Use the left/right cursor keys to select one of DARWIN's track inputs.
3. Press Connect (F2). A vertical line will appear indicating that the track is connected to the ADAT.
4. Continue to connect ADAT channels to tracks as desired.
5. You can also use the ADAT preset (Press the Preset soft-key) which automatically connects all eight ADAT channels to DARWIN's eight tracks.

- **ADAT tracks can only be routed to the same numbered track on DARWIN.**

BE CAREFUL	- Selecting input monitor on both DARWIN and the ADAT may result in digital feedback!!!

▶ To Transfer from the ADAT into DARWIN:

1. Follow the "Very Important Connection Instructions" on the previous page.
2. In the Routing screen, choose ADAT as a source and connect the tracks you wish to record using the left/right cursor controls and the connect function key.
3. Enable the tracks you wish to record on DARWIN.
4. Press Play on the ADAT and allow it to get up to speed.
5. Press Record-Play, then Play on DARWIN to begin recording.
6. Press Stop on both units when you have finished transferring the tracks.

▶ To Transfer from DARWIN into the ADAT:

1. Follow the "Very Important Connection Instructions" on the previous page.
2. Enable the tracks you wish to record on the ADAT.
3. Press Record-Play on the ADAT and allow it to get up to speed.
4. Press Play on DARWIN to begin recording.
5. Press Stop on both units when you have finished transferring the tracks.

CONNECTING TO A FOSTEX RD-8®

The Optical Interface card can also be used to transfer audio between DARWIN and the Fostex RD-8. The RD-8 uses the Alesis data format and is completely ADAT compatible. The user interface on the RD-8 is slightly different from the ADAT and requires explanation.

FIRST - Select the ADAT routing in the Routing menu on DARWIN.

VERY IMPORTANT CONNECTION INSTRUCTIONS

- BOTH optical cables MUST be connected between the two units.
- The RD-8 must be set to receive an EXTERNAL digital clock source. On the Fostex RD-8 do the following:
  1) Press the **Data Edit** button.
  2) Press the **Chase On/Off** button.
  3) Use the **Up Arrow** button to select **"WordOPT"**.
  4) Press the **"Dig In"** button to record into the RD-8.

WARNING

Selecting input monitor on both DARWIN and the RD-8 may result in digital feedback which can be destructive to your monitor speakers.

ADAT is a registered trademark of Alesis corporation. E-mu Systems is a member of the ADAT

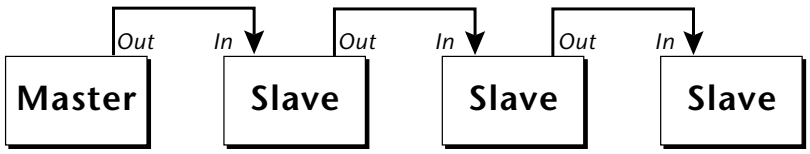
USING THE ADAT® SYNC CARD

The ADAT Sync card (Model 4012) allows up to 16 digital recorders which use the ADAT sync format to be synchronized with single-sample accuracy. When combined with the ADAT Optical Interface card (E-mu model 4011), up to eight tracks of audio can be digitally transferred back and forth between multiple recorders in perfect synchronization.

BASIC CONNECTION

The ADAT sync format uses a "daisy chain" arrangement, where the first unit in the chain is the "Master" and all units down the chain from the Master are "Slaves". The ADAT hardware interface consists of two 9-pin "D" connectors which are designated input and output. Successive units are connected sync-out to sync-in using the same type of 9-pin cable.

Proper Sync Cable Connection



The sync cables **SHOULD NOT** be connected in a LOOP, where the last unit is connected back to the first. When the units are turned on, the first unit in the chain automatically configures itself as the Master while all the other units automatically configure themselves as slaves. Use only ADAT-approved cables like the one supplied or available through your dealer. Computer cables may cause data errors and are not recommended.

MASTER OR SLAVE?

Before connecting anything, you should decide which unit is going to be the Master. With multiple DARWINs this doesn't matter, but when connecting to an ADAT, there are differences in operation depending on the way they are connected. The average lock up time is about the same either way, but consider the following scenarios:

DARWIN is the Master - ADAT is a slave

DARWIN will instantly locate to the selected point and begin playing. The ADAT will take time to locate and lock up and begin playing some time later. In this mode DARWIN may start playing much sooner than the ADAT.

Tip: *If you are using an ADAT BRC, the BRC is always the Master.*

ADAT is the Master - DARWIN is a slave

The ADAT will locate to the selected point and begin playing. It will then start sending timecode to DARWIN which then chases and locks to the ADAT before playing. In this mode, DARWIN will lock up and begin playing approximately three seconds after the ADAT begins playing.

SAMPLE RATE

We recommend recording all your projects at 48kHz unless you have an ADAT XT so you won't get confused by different timecode displays. The display clock on the standard ADAT will "run slow" if it is set to record at 44.1kHz.

Whichever sample rate you use, the sample rates should **ALWAYS BE THE SAME** when using multiple recorders.

POWER-UP ORDER

Tip: *If you are experiencing problems, always check the ID number of each machine in the chain. Each machine needs to have a unique ID number.*

The order in which you power up devices in the chain can be important because of the different boot-up times of DARWIN and ADAT. Errors can also occur due to the way the ADAT ID protocol works.

A good way to avoid problems is to power up the Master device first, then power-up the next unit, wait for it to boot up, then power up the next machine and so on.

TRANSPORT CONTROL BEHAVIOR

Track Record Enables

Record enables can be remotely enabled from a Alesis BRC. A Master DARWIN cannot arm tracks on slave DARWINs or ADATs.

Stop

DARWIN sends a locate command when it stops so slave units can be in the same vicinity after fast forward/rewind or shuttling. This feature was included to streamline multiple DARWIN setups. The Stop button always works even if DARWIN is a slave unit.

• Another feature of the Stop button on DARWIN is that it can toggle the threaded/unthreaded state of slave ADATs. Press the Stop button on DARWIN to thread or unthread the ADAT tape. (The Stop LED on the ADAT will begin flashing to indicate the unthreaded state.)

Rewind/Fast Forward

The multiple speed fast forward and rewind controls on a Master DARWIN will control a slave DARWIN but there is no correlation on an ADAT machine.

Jog/Shuttle

The Jog/Shuttle wheels are not transmitted over the sync bus.

Play

In slave mode, DARWIN chases and locks to the Master when the Master goes into Play. If an ADAT is Master, DARWIN will not lock up until ADAT begins transmitting stable timecode, which takes a few seconds. The Play LED will flash slowly until DARWIN locks up at which time it will stop flashing and remain on.

If the Master unit is stopped, you can still operate the Play button on a slave DARWIN. The slave will continue to use the Master's sample clock, but is no longer synchronized to timecode.

DARWIN must be in a mode where the Transport is enabled to receive play commands from a Master unit. (For example: You can't be in the Disk screen and chase to a Master.)

Record

When DARWIN is the Master, pressing Record + Play places any machine with record enabled tracks into record mode.

Auto-punch from the BRC is not implemented in this software release. Remote auto-punch is available through the use of an MMC controller like the J.L. Cooper Cue Point or any of a wide variety of sequencers.

Locate

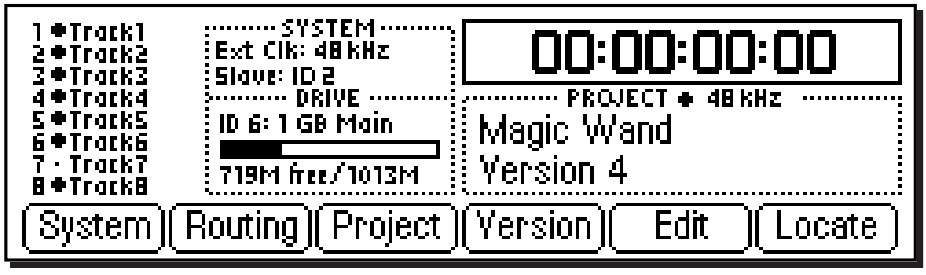
A DARWIN Master sends a locate whenever Return-to-Zero is pressed, whenever Stop is pressed from Play mode, or whenever one of the Stored Locate points is selected. Locate points from a BRC or Master ADAT are recognized by slave DARWINs.

TIMELINE

The maximum tape length of an ADAT is 53 minutes. DARWIN's timeline ranges from -1 hour to 11 hours and can be offset to start anywhere in a 24 hour SMPTE day. This affects MMC time but not ADAT Sync time. The "Project Start Time" equals Zero on the tape and this relationship does not change when you alter the Project Start Time. **Changing the Start Time does NOT change the time sent out over the ADAT Sync network.**

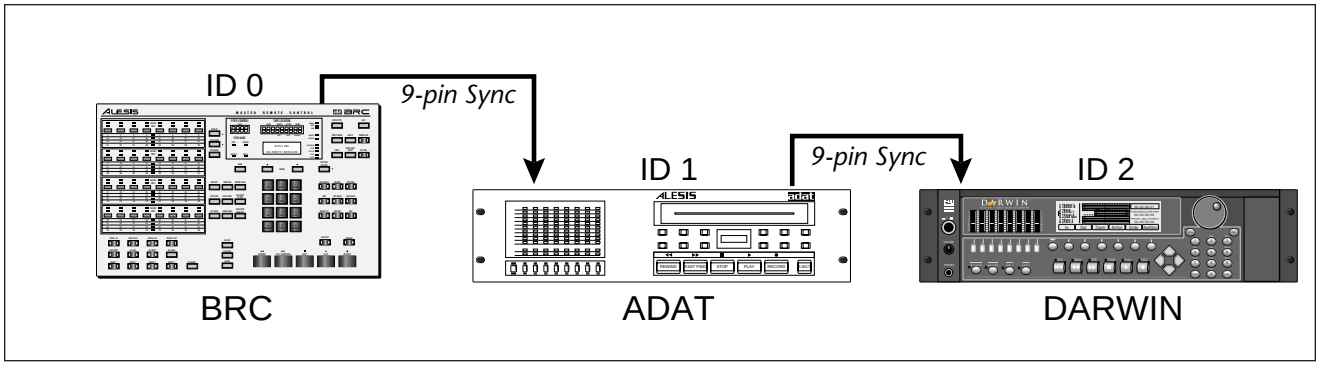
DISPLAY

The main screen contains a system display which shows Internal or External clock status and the ID Number if two or more units are connected via the 9-pin sync interface.



ID NUMBERS

ID numbers start with the Master which is ID 1 (Except a BRC which is always ID 0) and continue on in consecutive order.

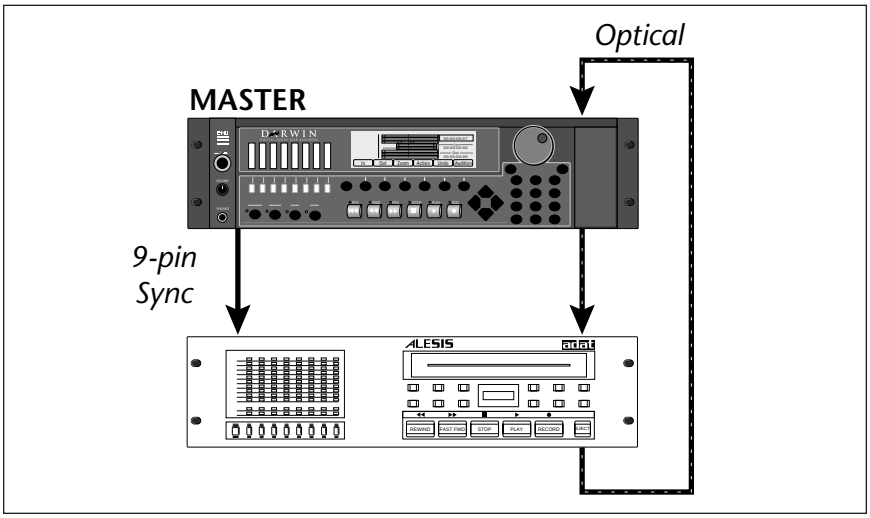


- If two machines come up with the same ID number, cycle power on the last machine with the conflicting ID so that it will correctly re-identify itself.

USING THE DIGITAL OPTICAL INTERFACE
(in conjunction with the ADAT sync card)

Caution: *Selecting input monitor on both DARWIN and the ADAT may result in digital feedback which can damage your speakers or ears!!!*

Using the Digital Optical Interface with the ADAT Sync Card allows you to transfer up to eight tracks at a time between recorders. Unlike the 9-pin sync cables, the fiber optic cable can be connected in a loop as shown below. Only one optical cable is necessary for digital transfers when using the 9-pin sync interface. Optical transfer can go either direction when using the 9-pin sync cable. The unit receiving digital audio is switched to digital mode (via the Digital In button on the ADAT or in the Routing screen on DARWIN).



▶ To Digitally Transfer from DARWIN into ADAT

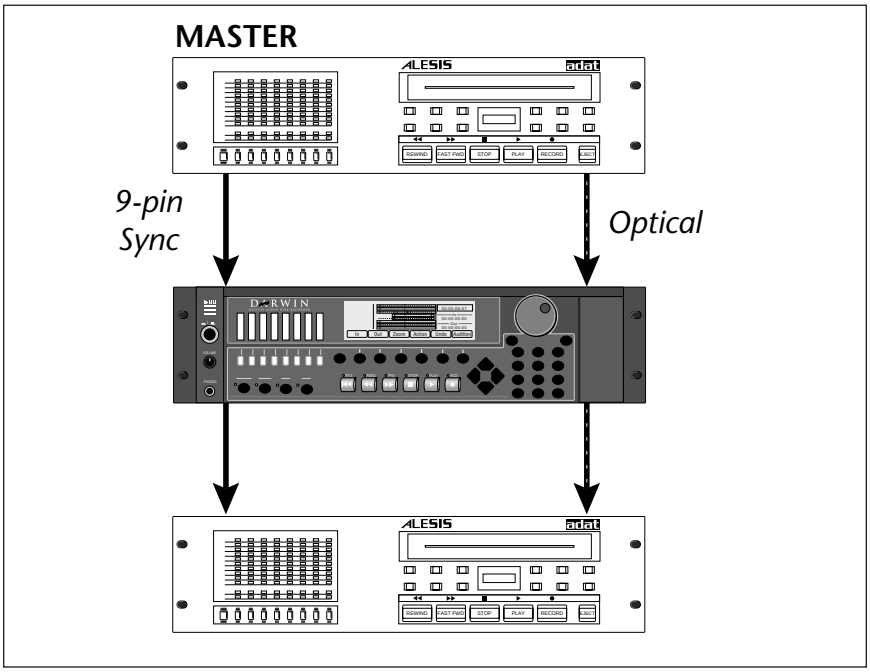
1. On the standard ADAT, press the **DIGITAL IN** button again on the ADAT, lighting the LED.
2. **Enable** the tracks you wish to record on the ADAT.
3. Press **Play** on the Master unit and allow time for the ADAT to get up to speed. The Play LEDs will stop flashing to indicate that the units are locked.
4. **Arm** the desired tracks on the ADAT.
4. **Punch-in** on the Master unit to begin recording.
5. Press **Stop** on the Master unit when you have finished.

▶ To Digitally Transfer from ADAT into DARWIN

1. In the Routing screen on DARWIN, choose the **ADAT** Preset routing.
2. **Arm** the tracks you wish to record on DARWIN.
3. Press **Play** on the Master unit and allow time for both units to lock (indicated when the Play LED stops flashing).
4. **Punch-into Record** on DARWIN to begin recording.
5. Press **Stop** on the Master unit when you have finished transferring the tracks.

▶ To Digitally Transfer Through DARWIN:

Suppose you have 2 ADATs and a DARWIN connected as in the diagram above and you want to digitally transfer from the Master ADAT through DARWIN to the second ADAT.



1. In the Routing screen on DARWIN, choose the **ADAT** Preset routing.
2. **Enable** all tracks on DARWIN. This turns **Monitor Thru** On.
3. The Optical interface will now be passed through DARWIN.

ADAT tracks can ONLY be routed to the same numbered track on DARWIN.

To pass data through an ADAT, press the Digital In button on the ADAT.

OTHER IMPORTANT POINTS

1. If there is a BRC in the system, it must be turned Off or its sync output disconnected before transferring digital data. The BRC clock contains too much jitter and audio performance and loss of sync will result. (You can also sync the BRC to external video or word clock to reduce the jitter.)
2. You can transfer from DARWIN into the ADAT at 44.1 kHz, but you must set the ADAT to 44.1 kHz first. To select 44.1 kHz rate, use the ADAT pitch control and set it to -147 cents. The display will momentarily change to 44.1. The sample rate of the Master unit is automatically selected on slave DARWINs or ADAT XTs.
3. **Selecting input monitor on both DARWIN and the ADAT may result in digital feedback** which can be destructive to your monitor speakers.

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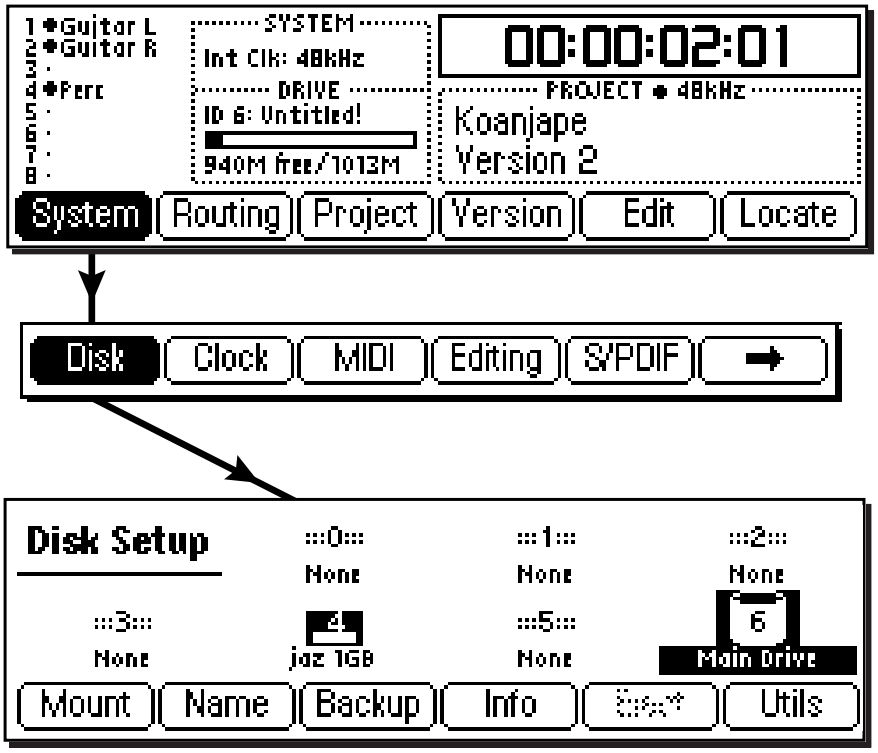
Disk Utilities

The Disk Utilities menu contains functions relating to the Audio SCSI bus drives which store the audio data.



▶ To Access the Disk Menu:

1. Press the **System** function key (F1).
2. Press the **Disk** function key (F1).

Selecting a Disk Drive

In order to initiate a particular disk operation, you must first select the desired disk drive. The Disk Setup screen graphically shows every drive connected to the audio SCSI bus. Select the desired drive using the cursor keys. The selected drive appears "inverted" like drive number six in the display above.

Mount Drives

This utility instructs DARWIN to check the SCSI bus for the presence of SCSI devices. Use this function whenever a connected SCSI device does not appear in the disk select screen.

Tip: *You may have to use the Mount Drives function on certain hard disk drives which have a slow spin-up time.*

• Removable media hard disks such as the Jaz drive need to be mounted whenever a new disk is inserted.

▶ To Mount Drives:

1. Press the **System** function key (F1). A pop up menu will appear.
2. Press the **Disk** function key (F1). The Disk Setup screen and A pop up menu will appear.
3. Press the **Mount** function key (F1). A status window will say: ***Scanning SCSI***, and all the available drives will be mounted.
4. Press **Exit** to return to the main screen.

Name Disk

This utility allows you to give each SCSI drive a name of up to 11 characters.

▶ To Name a Disk:

1. Press the **System** function key (F1). A pop up menu will appear.
2. Press the **Disk** function key (F1). The Disk Setup screen and a new menu will appear.
3. Select the disk drive you wish to name using the cursor keys.
4. Press the **Name** function key (F2). A status window will appear prompting you to rename the drive.

5. Name the disk drive using the numeric keypad, jog/shuttle wheels, and inc/dec keys. Move back and forth between letters using the left/right cursor keys. The up cursor key adds a space and the down cursor key deletes a space with each press.
6. Press **OK** (F5) to confirm the new name or the **Cancel** (F2) to cancel the operation.
7. Press **Exit** to return to the main screen.

Backup/Restore Disk

This function allows you to backup and restore the entire contents of your audio hard disk to a SCSI DDS type DAT drive. Projects cannot be backed-up individually. Backup time varies according to the size of you hard disk and type of DAT drive.

IMPORTANT: You should develop the habit of backing up all important data to more than one tape. If you'd ***HATE*** to lose it, **BACK IT UP!**

Tip: *DAT tape drives usually take a few seconds to eject the tape after you have pressed Eject.*

▶ To Backup a Hard Disk:

1. Press the **System** function key (F1). A pop up menu will appear.
2. Press the **Disk** function key (F1). The Disk Setup screen and a new menu will appear.
3. Select the drive you wish to Backup **From** using the cursor keys. When using Backup/Restore you always choose the drive containing the **Source** data. If you only have one tape drive, it will be selected automatically.
4. Press the **Backup** function key (F3). A status window will appear warning you that writing to the tape will erase all the data on that tape.

Caution: *Use only data grade DAT tape for backing up. Audio grade tape will produce errors and may not even work at all!*

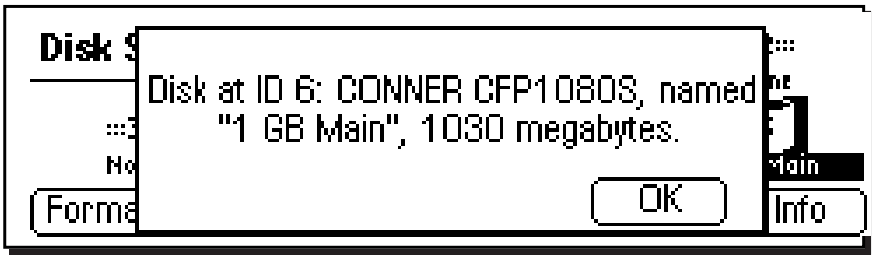
5. Press **OK** to backup the drive or **Cancel** to cancel the operation.
6. **To Restore:** Select the tape drive (from), then select the destination drive if asked (If you only have one hard disk drive, DARWIN will not ask).

Info

DARWIN will display information about the selected disk drive.

▶ To Get Disk Info:

1. Press the **System** function key (F1) from the main window. A new pop up menu will appear.
2. Press the **Disk** function key (F1). The Disk Setup screen and a new pop up menu will appear.
3. Select the desired disk drive using the cursor keys.
4. Press the **Info** function key (F4). A status window will appear with the vital statistics of the selected disk drive.



5. Press **OK** (F5) to return to the disk setup screen.
6. Press **Exit** to return to the main screen.

Eject

This function ejects a Jaz cartridge from the drive (if installed). If there is no Jaz drive installed this button will be greyed out and unavailable.

▶ To Eject the Jaz Cartridge:

1. Press the **System** function key (F1) from the main window. A new pop up menu will appear.
2. Press the **Disk** function key (F1). The Disk Setup screen and a new pop up menu will appear.
3. Select the desired disk drive using the cursor keys.
4. Press the **Eject** function key (F5). The Jaz cartridge will be ejected from the drive.
5. Press **Exit** to return to the main screen.

Ultilities Submenu

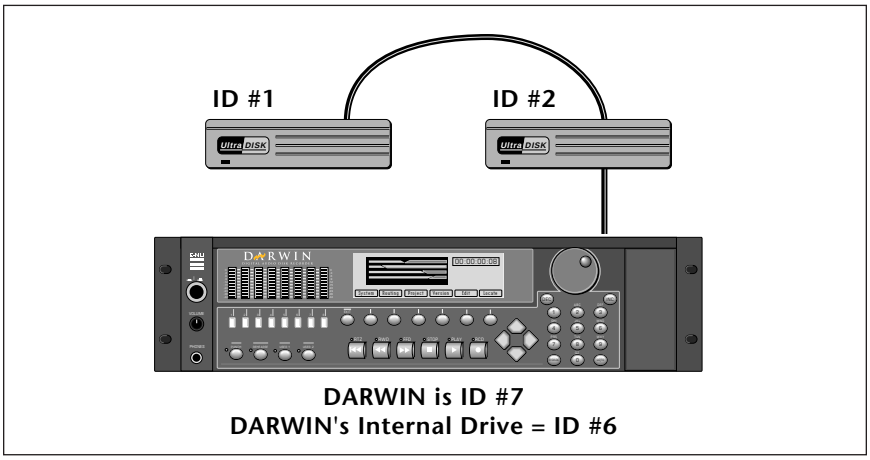
The utilities submenu contains two types of formatting routines.

Format Disk

Initializes a hard disk so that audio data can be stored on it. Many new disk drives now come pre-formatted and only need to be initialized and have the drivers installed on them. This takes much less time than completely low level formatting.

▶ To Connect an External Hard Disk to DARWIN:

1. **IMPORTANT!** Turn off Power to everything on the SCSI bus before connecting or disconnecting cables.
2. Make sure that each device on the SCSI bus has its own unique ID number. Check the Disk Setup menu to see which ID numbers are being used, then set your new drive to a different ID.



Each device in the SCSI chain must have its own unique ID number.

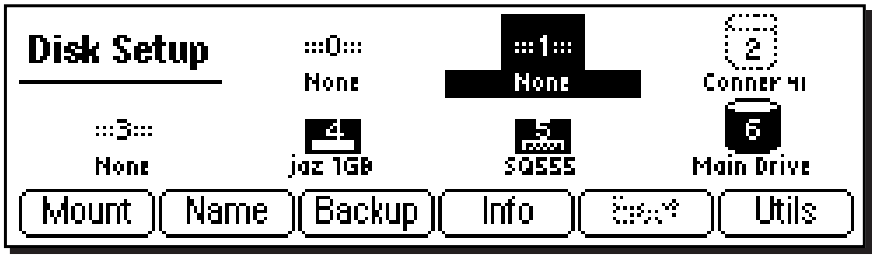
Drive Empty

Formatted Cartridge

Unformatted Cartridge

Tip: *A removable media drive appears as a solid icon with a slot at the bottom. The appearance of the slot shows the state of the cartridge.*

3. Power up the external SCSI devices first, then DARWIN.
4. Press the **System** function key (F1) from the main window. A pop up menu will appear.
5. Press the **Disk** function key (F1). The Disk Setup screen and a new pop up menu will appear.



6. The unformatted disk will not usually appear in the display. Press the **Mount** function key (F3). Unformatted fixed drives appear as a dotted outline in the display. Unformatted removable media drive icons are solid but have a slot which indicates the status of the cartridge within.

▶ To Format the Hard Disk:

1. Select the disk drive you wish to format using the cursor keys.
2. Press the **Utils** function key (F6). A new pop up menu appears.
3. Select **Format** (F1). The following status window will appear.

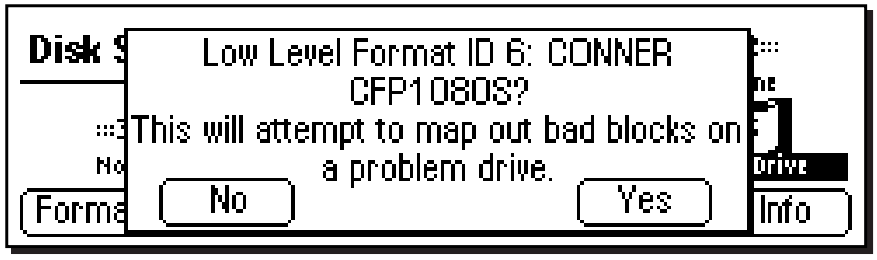
4. Press **Yes** (F5) to continue or **No** (F2) to cancel the operation.
5. A warning message will appear asking you if you are really sure. Press **Yes** (F5) to begin formatting or **No** (F2) to cancel the operation. Formatting installs the DARWIN file system onto the disk and only takes a few seconds.
6. Press **Exit** to return to the main screen.

Low Level Disk Format

This utility does a complete format on a hard disk that has been damaged or has developed disk errors. All new disk drives already have been low level formatted. This procedure can take a very long time, especially with large capacity disks, but maps out all bad blocks on the disk.

▶ To Low Level Format a Hard Disk:

1. From the **Disk** menu, select the disk drive you wish to format using the cursor keys.
2. Press the **Utils** function key (F6). A new pop up menu appears.
3. Select **LLFmt** (F2). The following status window will appear.



4. Press **Yes** (F5) to continue or **No** (F2) to cancel the operation.
5. A warning message will appear asking you if you are really sure. Press the **Yes** (F5) to begin formatting or **No** (F2) to cancel the operation. Low level formatting rewrites the entire disk and will take 5 to 10 minutes per gigabyte. Time to take a break.
6. A status window will appear to inform you when low level formatting is complete. Press **Exit** to return to the main screen.

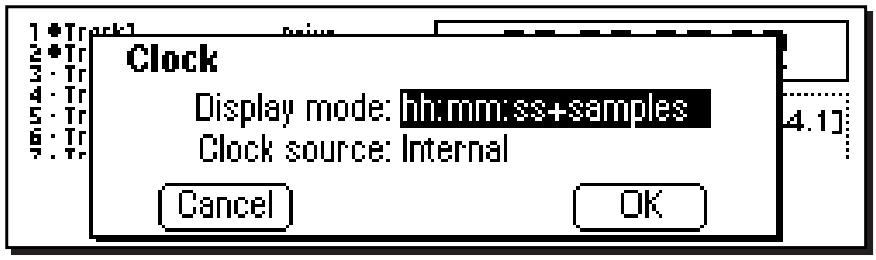
CLOCK

The clock window allows you to select either internal or external clock and selects the type of time display used in the main screen. External clocking is only available when the optional External sync card is installed. Otherwise external clocking cannot be selected. This menu also lets you choose between four types of time display.

hh:mm:ss:ff *(hours, minutes, seconds, frames)*
hh:mm:ss:ff.ff *(hours, minutes, seconds, frames, 100th frame*
hh:mm:ss.sss *(hours, minutes, seconds, milliseconds)*
hh:mm:ss + samples *(hours, minutes, seconds, samples)*

▶ To Change the Clock Settings:

1. Press the **System** function key (F1). A new pop up menu will appear.
2. Press the **Clock** function key (F2). The dialog box shown below will appear.



The Clock Source function is not currently implemented.

3. Select internal or external clocking if the optional Sync Card is installed.
4. Use the jog/shuttle wheels or inc/dec keys to select between the four time display formats.
5. Press **OK** (F5) to return to the main screen or **Cancel** (F2) to cancel the operation without keeping any changes.

MIDI

DARWIN can send out MIDI Time Code in order to synchronize with other devices such as a MIDI sequencer or certain multitrack recorders. It can also send and receive MIDI Machine Control so that DARWIN can be operated by remote control from an external computer or other MMC device.

- **MIDI Time Code** can be turned on or off. DARWIN Sends MIDI Time Code. DARWIN does not receive MTC. MIDI Time Code can be set to the following rates:

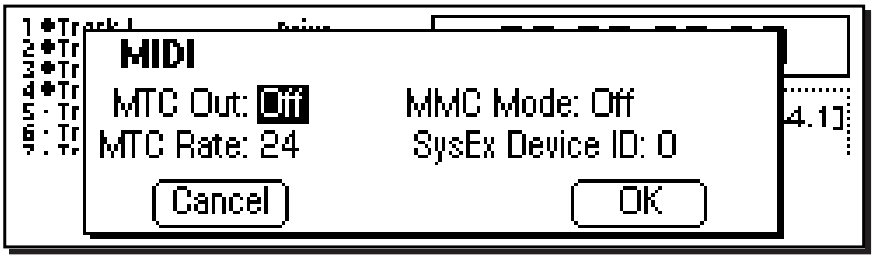
24 frames/sec *(US Film Rate)*
25 frames/sec *(European Film and Video Rate)*
30 frames/sec, Drop Frame
30 frames/sec *(US Black and White Video Rate)*

When using MIDI Time Code you should match the rate on DARWIN to the rate of the receiving device. *(Many MTC receivers will automatically set themselves to the incoming rate.)*

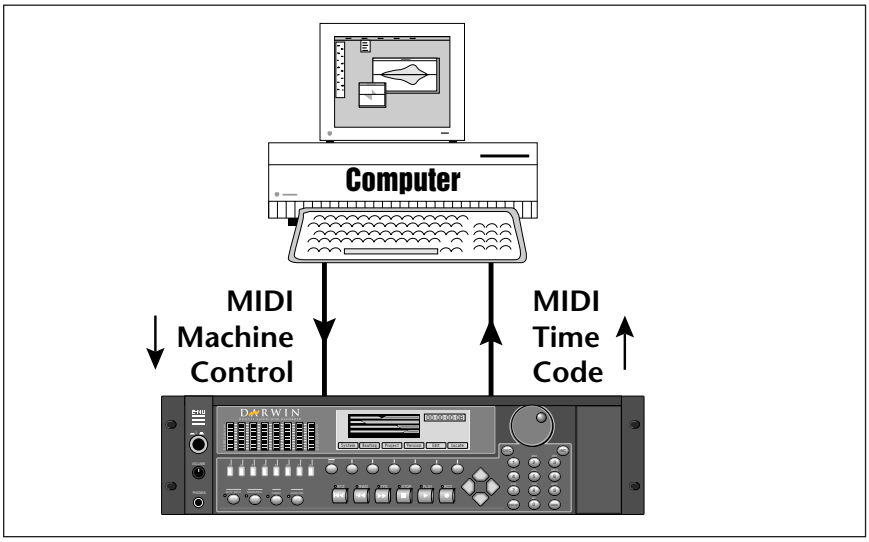
- **MIDI Machine Code** can be set for open or closed loop. Closed loop is used when both MIDI In and Out are connected between the two units. This ensures that the MIDI control unit and DARWIN will always know the status of the other unit and also speeds up operation.
- **Device ID** allows more than one DARWIN unit to be operated by the same remote controller. If multiple DARWINs are being used, each unit should have a different ID number.

▶ To Change the MIDI Settings:

1. Press the **System** function key (F1). A pop up menu will appear.
2. Press the **MIDI** function key (F3). The status window shown below will appear offering several choices.



3. Use the cursor keys to move between fields and the data entry control or inc/dec keys to change the values.
4. Press **OK** (F5) to return to the main screen or **Cancel** (F2) to cancel the operation without keeping any changes.



A closed loop MIDI connection, as shown above, allows DARWIN to be synchronized with a computer sequencer. A MIDI Machine Control command is issued from the computer to start DARWIN. DARWIN then begins transmitting MIDI Time Code which starts and clocks the sequencer.

EDITING PREFERENCES

DARWIN automatically keeps track of everything you do. This menu allows you to set the number of "Undos" that will be allowed, from 1 to 16. **To free up space on your hard disk, you must Reclaim Memory in the version menu.**

When editing, a short crossfade is applied to each splice to prevent clicks in your edits. The crossfade time is adjustable in this menu. The crossfade time is adjustable from 0 to 100 milliseconds.

Tip: Undos take up disk space. You can use the Reclaim Memory function (located under Version) to remove the Undo layers of the current Version and free up disk space.

▶ To Change the Editing Preferences:

1. Press the **System** function key (F1). A pop up menu will appear.
2. Press the **Editing** function key (F4). The status window shown below will appear.

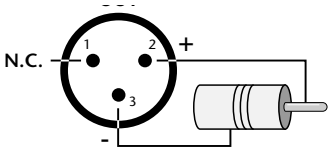
3. Use the cursor keys to move between fields and the jog/shuttle wheels or inc/dec keys to change the number of undos and the crossfade time.
4. Press **OK** (F5) to return to the main screen or **Cancel** (F2) to cancel the operation without keeping any changes.

S/PDIF MODES

DARWIN's S/PDIF digital output data format can be configured for either consumer or professional equipment (S/PDIF or AES/EBU). Although the audio quality is identical in either mode, some equipment will only accept data in one of the two modes.

Important: Connect BOTH cables and set the sending device to External Clock when transferring S/PDIF into DARWIN.

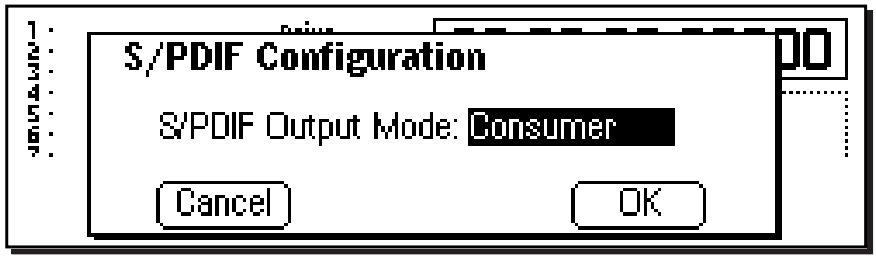
Tip: If you are connecting to a professional digital recorder with an AES input, you may need an adapter cable wired as in the diagram below.



• Since this wiring is not compliant with AES/EBU standards, it may not work in all situations!

▶ To Change the S/PDIF Digital I/O mode:

1. Press the **System** function key (F1). A pop up menu will appear.
2. Press the **S/PDIF** function key (F5). The status window shown below will appear.



3. Use the Jog/Shuttle wheels or the inc/dec keys to change the S/PDIF Output Mode.
4. Press **OK** (F5) to select the S/PDIF mode setting and return to the main screen or **Cancel** (F2) to cancel the operation.

ASSIGNABLE KEYS

The two assignable keys on the front panel of DARWIN can be programmed to call up special functions with a single key press. This eliminates paging through menus to get to special functions.

The Assignable Keys functions are not yet fully implemented in the initial software release. Did you send in your Warranty Card so we can notify you about software updates?

▶ To Change the Assignable Keys from the System Menu:

1. Press the **System** function key (F1). A pop up menu will appear.
2. Press the **Arrow** function key (F6). A new menu bar will appear.

3. Press the **AsgnKey** function key (F1). The status window shown below will appear.

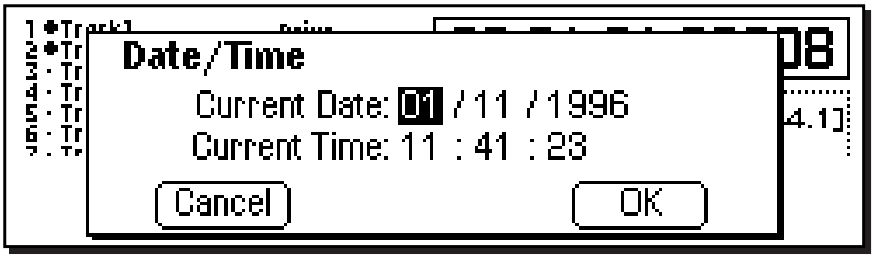
4. Use the Jog/Shuttle wheels or the inc/dec keys to change the function associated with each assignable key.
5. Press **OK** (F5) to store the assignable key settings and return to the main screen or **Cancel** (F2) to cancel the operation.

DATE

Projects and versions are automatically "time-stamped" with the date and time of their creation and modification which allows DARWIN to know the order of any changes you make. This menu allows you to set the correct time and date.

▶ To Change the Date Setting:

1. Press the **System** function key (F1). A pop up menu will appear.
2. Press the **Arrow** function key (F6). A new pop up menu will appear.
3. Press the **Date** function key (F2). The dialog box shown below will appear.



4. Use the cursor keys to move between fields and the jog/shuttle wheels or inc/dec keys to change the date and time.

- Note that the time is shown in military or 24 hour time. The first 12 hours (00-11) correspond to the AM hours and the second 12 hours (12-23) to the PM hours of the day.

5. Press **OK** (F5) to return to the main screen or **Cancel** (F2) to cancel the operation without keeping any changes.

CONTRAST

This function allows you to adjust the contrast of the liquid crystal display for easy reading at any angle.

▶ To Change the Contrast:

Tip: The liquid crystal display goes into "Sleep" mode after 30 minutes of non-activity to extend the life of the backlight.

1. Press the **System** function key (F1). A pop up menu will appear.
2. Press the **Arrow** function key (F6). A new pop up menu will appear.

3. Press the **Contrast** function key (F3). A status window will appear.
4. Use the jog/shuttle wheels or inc/dec keys to adjust the contrast for easy viewing.
5. Press **OK** (F5) to return to the main screen or **Cancel** (F2) to cancel the operation without keeping any changes.

TESTS

These functions are included to allow qualified technicians to test various functions of DARWIN. Factory Use Only.

ABOUT

This screen displays the current software version that is resident in DARWIN. It also credits the creators of DARWIN.

▶ To Display the Software Version:

1. Press the **System** function key (F1). A pop up menu will appear.
2. Press the **Arrow** function key (F6). A new pop up menu will appear.
3. Press the **About** function key (F5). The status window will appear listing the software version
4. Press the **Credits** function key (F6) to list the DARWIN team members. Press **Exit** twice to return to the main screen.

4 Routing

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Submixer 57

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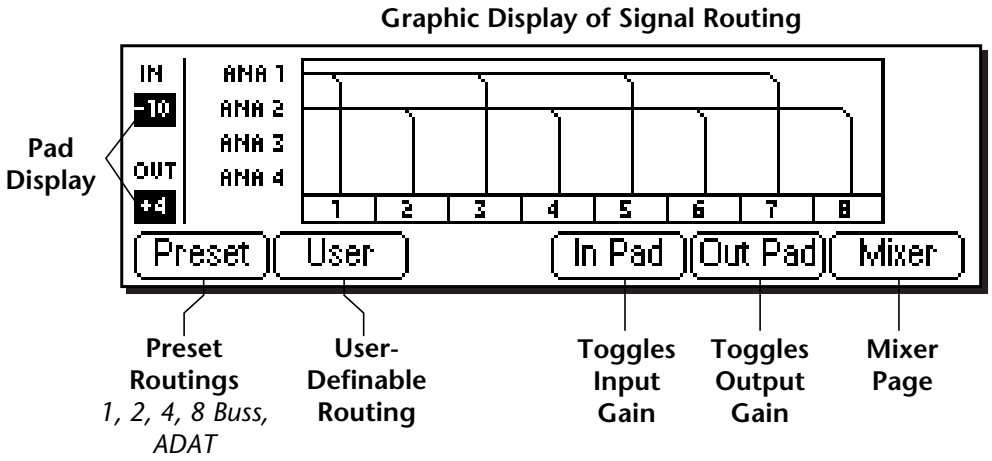
Routing Module



The Routing module is where analog and digital inputs are connected to the recording tracks. DARWIN has four analog inputs (eight with the optional analog interface card) and two S/PDIF digital inputs. The routing module also contains the internal submixer which allows multiple tracks to be bounced down into one or two tracks. This module also allows you to set DARWIN's inputs and outputs to either -10 dBu or +4 dB levels for easy interfacing with your mixer and other equipment.

Preset Routings

DARWIN contains several preset routings as a convenience. Once a routing is selected, you can enable specific tracks for recording using the track record enable buttons.

◩ The 8-buss and ADAT options only appear on the screen when the corresponding option card is installed.

1 Buss - Analog input 1 is routed to all eight tracks.

2 Buss - Analog input 1 is routed to tracks 1, 3, 5, 7 *(odd)*.
Analog input 2 is routed to tracks 2, 4, 6, 8 *(even)*.

4 Buss - Analog input 1 is routed to tracks 1 and 5.
Analog input 2 is routed to tracks 2 and 6.
Analog input 3 is routed to tracks 3 and 7.
Analog input 4 is routed to tracks 4 and 8.

8 Buss - *(Available only with the optional Analog Input Expander)*
Each of the eight analog inputs is routed to one of the eight tracks.

ADAT - *(Available only with the optional ADAT Optical interface)*
Each ADAT input is routed to one of the eight tracks.

▶ To Select a Preset Routing:

1. Press the **Routing** soft-key (F2). The routing screen will appear.
2. Press the **Preset** function key (F1). Another row of function keys will appear allowing you to choose 1, 2, 4, or 8 buss routings.
3. Select the desired preset routing.
4. Press **Exit** to return to the main screen.

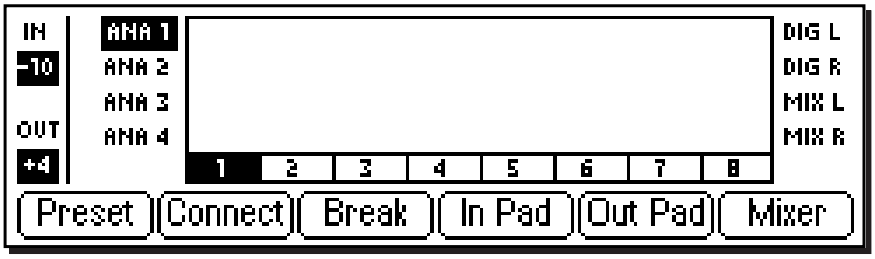
User Routing

While you will generally use one of the Preset Routings, the User Page can be used for special setups such as S/PDIF transfers or an internal bounce.

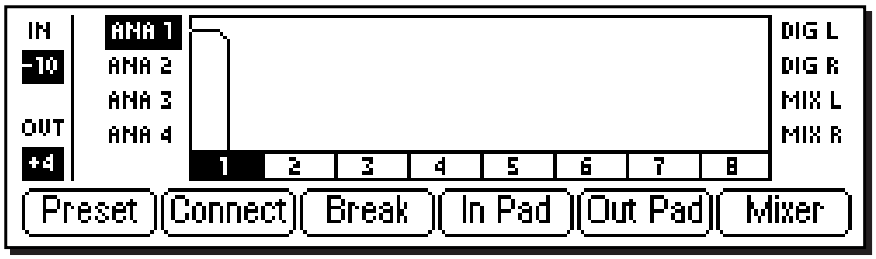
The user routing function key allows you to set up your own routing scheme. Any input can be routed to any track. Once your routing is programmed, you can enable specific tracks for recording using the track record enable buttons.

▶ To Set up a User Routing:

1. Press the **Routing** soft-key (F2). The routing screen will appear.
2. Press the **User** function key (F2). The screen shown below will appear (if User routing is already selected, omit this step).

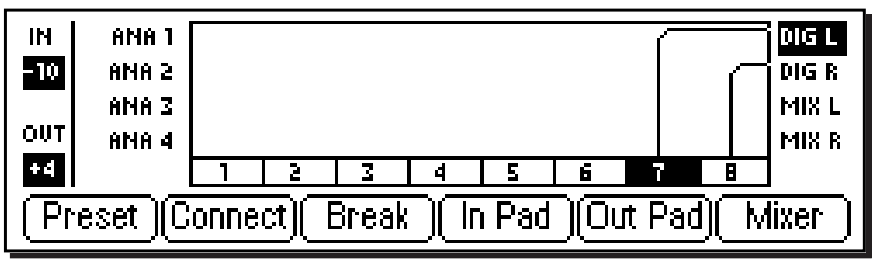


3. To connect an input to a track, select the input using the up/down cursor keys and the track using the left/right cursor keys. The selected inputs and track will be highlighted. In the screen above, analog input one is all set to be connected to track 1.



4. Press the **Connect** function key (F2) to make the connection.
5. To break a connection, select the input and track number, then press the **Break** function key (F3). Alternately, you can simply select a new routing (such as analog 1 to track 2) and press **Connect**. The old connection will be broken and the new connection made.
6. The S/PDIF digital inputs and the submixer outputs can also be routed to any of the tracks. Use the up/down cursor keys to select the digital inputs or the submixer outputs.

Caution: *Make sure you have the digital input connected to a working source BEFORE connecting it in the routing screen. Monitoring unconnected digital inputs is a noise and static-filled experience.*



7. Press **Exit** to return to the main screen.

Input/Output Pads

The amount of attenuation on the inputs and outputs is selectable between -10 dBu and +4 dB. A setting of -10 dBu is designed to interface with unbalanced consumer equipment and +4 dB matches professional, balanced equipment levels. The input and output pads should be set so that both DARWIN and your mixer receive a good signal level at a near unity settings on the mixer. Use the meters on DARWIN and on your mixer to verify proper levels.

▶ To Set up the Input & Output Pads:

1. Press the **Routing** function key (F2). The routing screen will appear.
2. To adjust the input attenuation, press the **In Pad** function key (F4). The indicator on the left side of the display will toggle between -10 and +4.
3. To adjust the output attenuation, press the **Out Pad** function key (F5). The indicator on the left side of the display will toggle between -10 and +4.
4. After setting the pads, press **Exit** to return to the main screen.

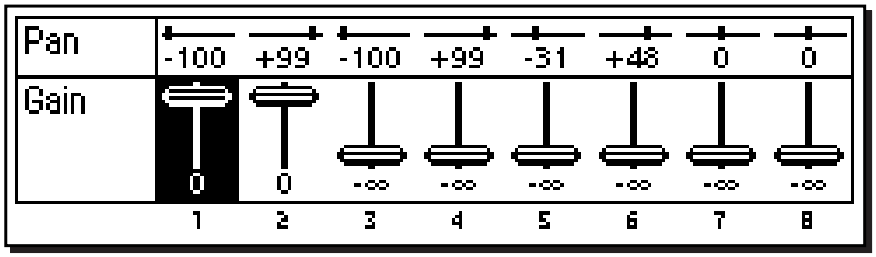
Caution: *There is a two sample delay when the outputs of the mixer are routed back to the track inputs when "bouncing" tracks. Use Move to remove the first two samples to avoid this delay which could cause phase problems if the bounced tracks are mixed back in with the original sources.*

Mixer

The mixer is an 8 x 2 digital submixer which can be used to create a submix of several tracks and re-record them back onto one or two other tracks. The headphone output and the digital S/PDIF output are also taken from the output of the submixer. The attenuators are calibrated in decibels with 0 dB equal to full level. The pan controls are adjustable from -100 to +100 with a center position of zero.

▶ To Adjust the Submixer:

1. Press the **Routing** function key (F2). The routing screen will appear.
2. Press the **Mixer** function key (F6). The mixer screen will appear.

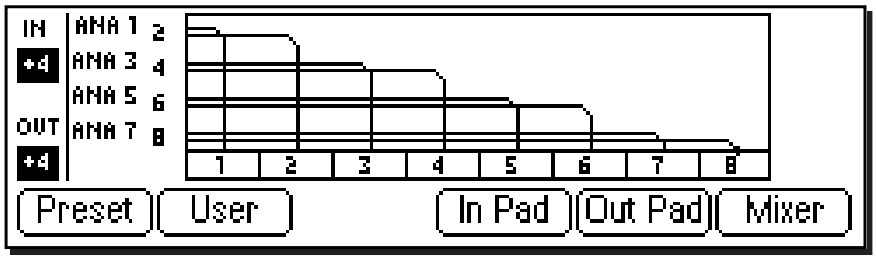


Tip: *Pressing 0 on the numeric keypad will instantly set the pan to center or the attenuator to full level. The numeric keypad is very useful in the screen to set values quickly and accurately.*

3. Use the cursor keys to select the desired control and use the numeric keypad, inc/dec keys or the jog/shuttle wheels to adjust the value.
4. After adjusting the submixer, press **Exit** to return to the routing screen.
5. Press **Exit** again to return to the main screen.

The Analog Input Expander Card

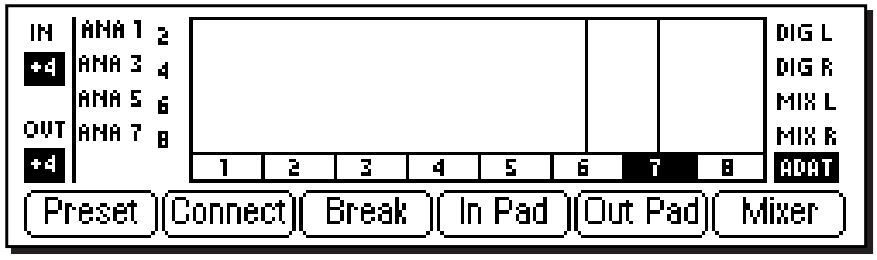
When the optional Analog Input Expander card is installed, eight inputs are displayed along the left side of the routing screen. The diagram below shows each of the eight inputs being routed to a separate track using the 8-buss preset. The presence of the expander card is automatically sensed on power up and the additional inputs are added to the screen.



The ADAT® Optical Digital Interface

When the optional ADAT Optical Digital Interface card is installed, another option is displayed on the right side of the routing screen and another preset appears in the routing presets. The ADAT optical interface allows DARWIN to be connected to an Alesis ADAT digital recorder in order to transfer up to eight tracks of digital audio in both directions.

1. BOTH optical cables MUST be connected between the two units.
2. The ADAT must be set to receive an EXTERNAL digital clock source. Press and hold SET LOCATE then press the DIG IN button on the ADAT. The display will change to read, “dig”.
   - **On the ADAT XT** - press CLOCK SOURCE repeatedly until “48k Digital” appears in the display.
3. On the standard ADAT, press the DIG IN button again on the ADAT, lighting the LED.



▶ To Route an ADAT Channel to a Track:

1. Use the up/down cursor keys to select the ADAT input.
2. Use the left/right cursor keys to select one of DARWIN's track inputs.
3. Press **Connect** (F2). A solid vertical line will appear indicating that the track is connected to the ADAT.

The ADAT tracks can only be routed to the same numbered track on DARWIN.

5 Project

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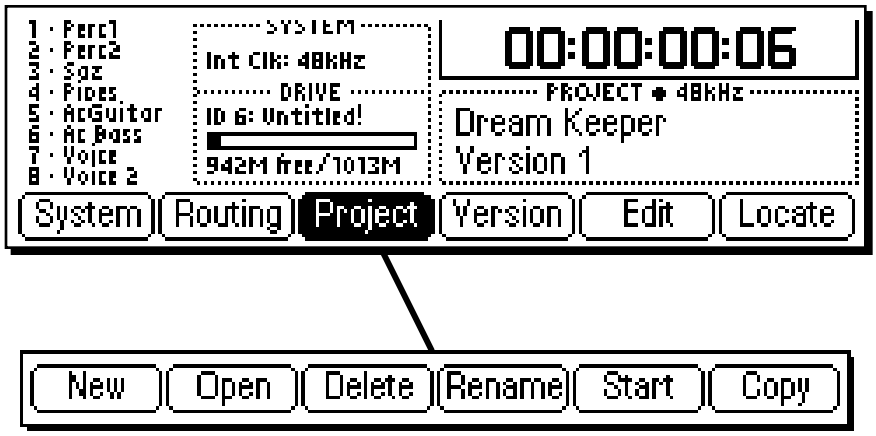
PROJECT

The Project menu contains several functions relating exclusively to projects such as creating a new project, opening, deleting, renaming and making copies of projects.

Main Screen



The Project menu contains six items:

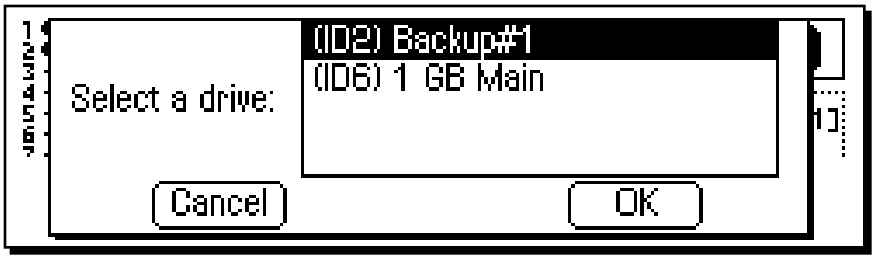
New	-	Creates a new project and allows you to name and set the sample rate for the project.
Open	-	Opens a project.
Delete	-	Allows you to erase a project from the hard disk
Rename	-	Allows you to name or rename a project
Start	-	Allows you to set the start time for a project.
Copy	-	Allows you to copy a project to another hard disk.

NEW

This function creates a place to put new recordings. You can also name your new project and set the sample rate to either 44.1 kHz or 48 kHz. You cannot change the sample rate after a project is created.

▶ To Create a New Project:

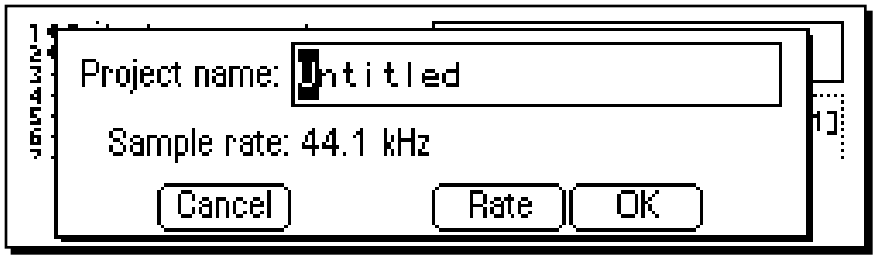
1. Press the Project function key (F3). A pop up menu will appear.
2. Press the New function key (F1). If you have more than one hard disk drive connected, the following dialog box will appear.



3. Select the hard disk drive on which you want the new project to be placed. Press OK (F5) to continue or Cancel (F2) to cancel the operation.

Tip: When naming, the down cursor key will delete a character and the up cursor will add a space.

4. The following dialog box will appear. Name the new project using the jog/shuttle wheels, inc/dec keys or the alphanumeric keypad in conjunction with the left/right cursor keys.



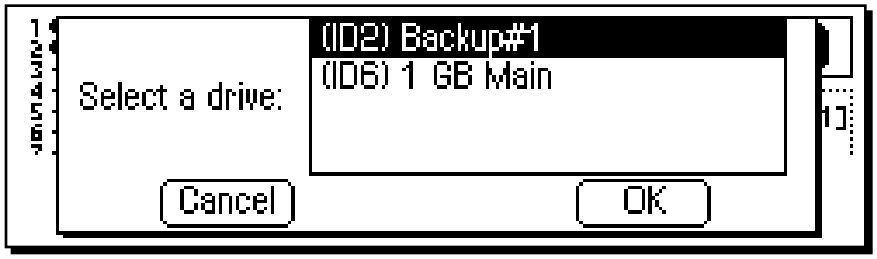
5. The selected sample rate will be shown. Toggle between the two sample rates by pressing the Rate soft key (F4).
6. Press OK (F5) to create a new project or Cancel (F2) to cancel the operation.

OPEN

This function allows you to select and open a project.

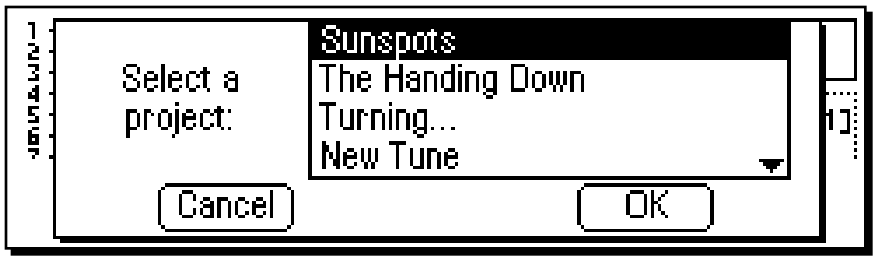
▶ To Open a Project:

1. Press the Project function key (F3).
2. If you have more than one hard disk drive connected, the following dialog box will appear.



Disk Select: The "Select Drive" dialog box only appears if you have more than one drive connected.

3. Select the hard disk drive containing the project you wish to open. Press OK (F5) to continue or Cancel (F2) to cancel the operation.
4. Press the Open function key (F2). The following dialog box will appear. The small arrow in the lower right corner indicates that there are more projects listed below. Cursor down to access them.



5. Select the project you wish to open using the up/down cursor keys.

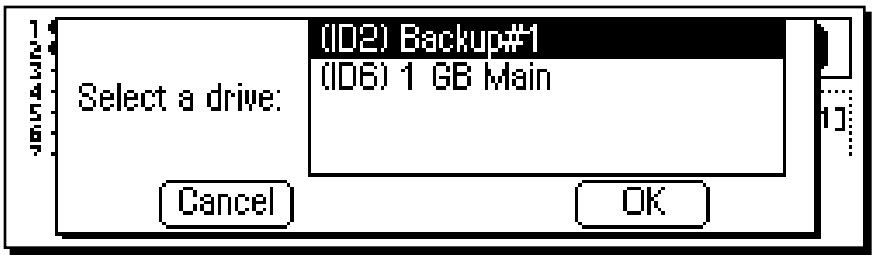
6. Press OK (F5) to open a project or Cancel (F2) to cancel the operation.

DELETE

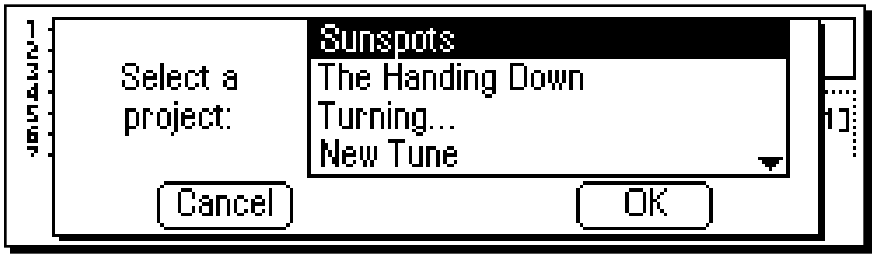
This function allows you to delete a project. Caution: This operation destroys all versions and audio data associated with the project!

▶ To Delete a Project:

1. Press the Project function key (F3).
2. If you have more than one hard disk drive connected, the following dialog box will appear.



3. Select the hard disk drive containing the project you wish to delete. Press OK (F5) to continue or Cancel (F2) to cancel the operation.
4. Press the Delete function key (F3). The following dialog box will appear.



5. Select the project you wish to delete using the up/down cursor keys. Press OK (F5) to continue or Cancel (F2) to cancel the operation.
6. Stop and consider the consequences of your action. Have you backed up the data to another drive?

7. Press Yes (F5) to delete the project or No (F2) to cancel the operation.

RENAME

This function allows you to rename the current project.

▶ To Rename a Project:

1. Press the Project function key (F3). A pop up menu will appear.
3. Press the Rename function key (F4). The following dialog box will appear.

4. Select the project you wish to rename using the up/down cursor keys.
5. Rename the project using the left/right cursor keys and the jog/shuttle wheels, inc/dec keys or the alphanumeric keypad.
6. Press OK (F5) to rename or Cancel (F2) to cancel the operation.

START TIME

This function allows you to set the time at which a project will begin. This feature is useful when synchronizing to other equipment. MIDI Time Code transmitted from DARWIN will also begin at the Start Time.

▶ To Set the Project Start Time:

1. Press the Project function key (F3). A pop up menu will appear.
2. Press the Start function key (F5). The following dialog box will appear. The start time format which will be displayed depends on the Clock setting in the System menu.

Tip: Pressing the Return-To-Zero transport control immediately moves the counter to the programmed Start Time.

3. Set the start time using the jog/shuttle wheels, inc/dec keys or numeric keypad. Use the left/right cursor keys to move between hours, minutes, seconds and frames (subframes, milliseconds, or samples).
4. Press OK (F5) to confirm the start time or Cancel (F2) to cancel the operation.

Tip: When syncing with tape based machines, it is a good idea to start projects at 01:00:00:00 because some machines get lost if they rewind below zero.

• All ADAT tapes start at 01:00:00:00

COPY PROJECT

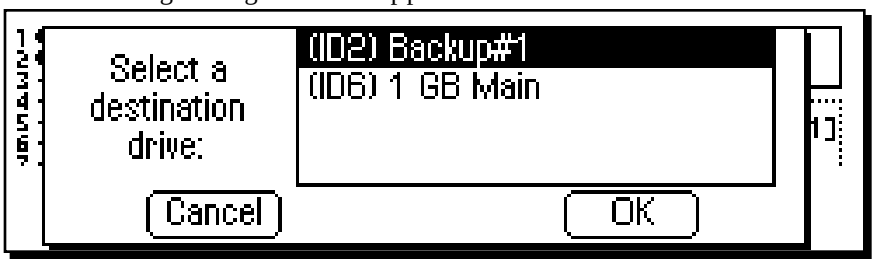
You can make copy of a project and store it on any available drive. This function duplicates all the data in the project, including all version data. Copy project is used to backup individual projects to other disk drives. The backup function (System, Disk) backs up the entire disk.

▶ To Copy a Project:

1. Press the Project function key (F3). A pop up menu will appear.
2. Press the Copy function key (F6). The following dialog box will appear.

Tip: Pressing the Exit key allows you to escape from Copy Project during execution of the copy process.

3. If you have more than one hard disk drive connected, the following dialog box will appear.



4. Select the destination drive for the copied project using the cursor keys.
5. Press OK (F5) to continue or Cancel (F2) to cancel the operation.
6. If you pressed OK, you will be asked to rename the destination project using the jog/shuttle wheels, inc/dec keys or the alpha-numeric keypad.

Tip: When naming, the down cursor key will delete a character and the up cursor will add a space.

7. Press OK (F5) to copy the project or Cancel (F2) to cancel the operation.

6 Version

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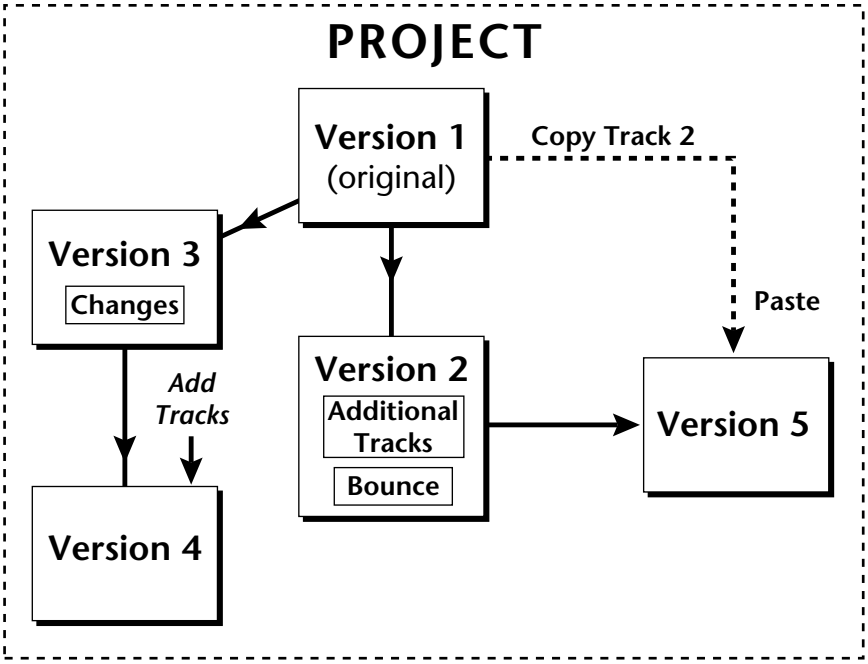
VERSION

A Version is a playlist — a list of audio sections and information on when to play them. When you make an edit, you are not actually changing sound data, you are only changing the order in which the sound files are played.

Creating a new version of a project could be likened to putting a new reel of tape on the tape recorder, except that the new reel already has your project recorded on it! In fact, we often refer to the use of version as “Virtual Slave Reels”. The new version of the project can be edited or modified to your heart's desire without affecting the original version.

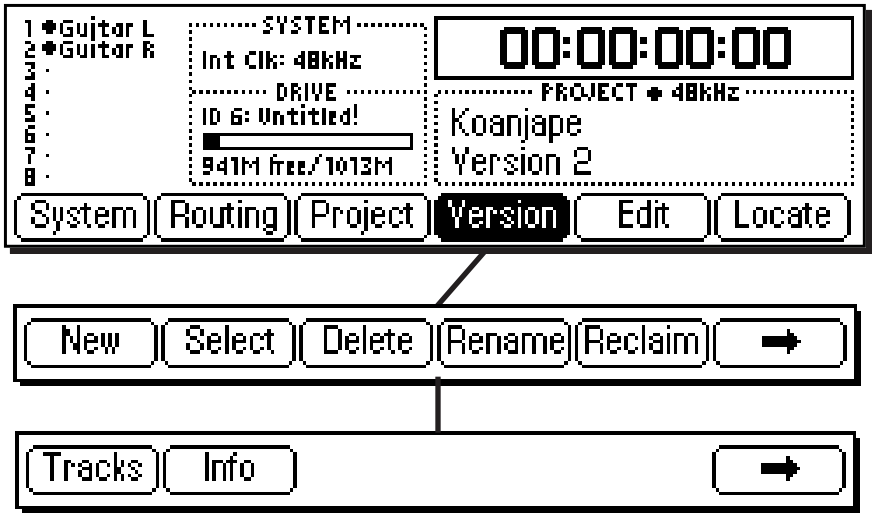
This module contains functions relating exclusively to versions such as creating a new version, selecting, renaming, and deleting. It also contains a utility for naming tracks and for reclaiming the memory used for backups.



By creating new versions of a project, you can make changes and experiment freely without affecting previous versions of your work.

The Version module contains seven main sub menus:

New	-	Creates a new version and allows you to name it.
Select	-	Selects a version.
Delete	-	Allows you to erase a version.
Rename	-	Allows you to rename a version.
Reclaim	-	Allows you to reclaim memory by discarding data that was automatically backed-up.
Tracks	-	Allows you to name each of the eight tracks.
Info	-	Displays important information about the number of Edit Events used in the current version.



▶ To Enter the Version Menu:

- Press the **Version** function key from the main menu. The pop up menu shown above will appear.

Transferring Tracks Between Versions

Once you have created new versions of your song, you can move tracks back and forth between the different versions. Here's how:

▶ To Transfer Audio Data From One Version to Another:

1. **Be in the Source** version.
2. **Select the Tracks** to be copied
3. **Select the "In" and "Out" points** for the copy.
4. **Transfer the selection** onto the clipboard using **Copy** or **Cut**.
5. **Select the "Desitination"** Version.
6. **Select the track(s)** to receive the copy.
7. **Select the "In" point** where the copy will begin.
8. **Transfer the contents of the clipboard** to this location using **Insert** or **Replace.**

Note: The clipboard can transfer audio from one **Version** to another, but it cannot transfer audio from one **Project** to another.

New

This function creates a new version. The new version is a copy of the current version.

▶ To Create a New Version:

1. Press the **Version** function key (F4). A pop up menu will appear.
2. Press the **New** function key (F1). The following dialog box will appear.

Tip: *When naming, the down cursor key will delete a character and the up cursor will add a space.*

3. Name the new version using the jog/shuttle wheels, inc/dec keys or the alphanumeric keypad.
4. Press **OK** (F5) to create a new version or **Cancel** (F2) to cancel the operation.

Select

This function allows you to select another version of your project.

▶ To Select a Version:

1. Press the **Version** function key (F4). A pop up menu will appear.
2. Press the **Select** function key (F2). The following dialog box will appear.

3. Select the desired version using the up/down cursor keys.
4. Press **OK** (F5) to select another version or **Cancel** (F2) to cancel the operation.

DELETE

This function allows you to delete a version of the current project. **Caution: This operation destroys ALL DATA exclusive to the version!**

▶ To Delete a Version:

1. Press the **Version** function key (F4). A pop up menu will appear.

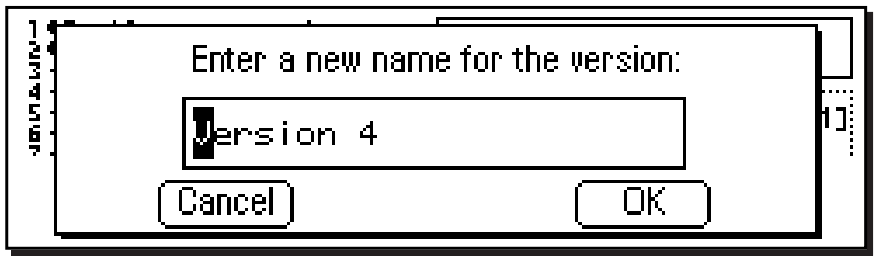
2. Press the **Delete** function key (F3). The following dialog box will appear.
3. Select the project version you wish to delete using the up/down cursor keys. Press **OK** (F5) to delete or **Cancel** (F2) to cancel the operation.
4. The display will inquire if you really want to delete the version. Stop and consider the consequences of your action. Have you backed up the data to another drive?
5. Press **OK** (F5) to delete the version or **Cancel** (F2) to cancel the operation.

RENAME

This function allows you to rename the current version.

▶ To Rename a Version:

1. Press the **Version** function key (F4). A pop up menu will appear.
2. Press the **Rename** function key (F4). The following dialog box will appear.



Tip: *When naming, the down cursor key will delete a character and the up cursor will add a space.*

3. Rename the version using the left/right cursor keys and the jog/shuttle wheels, inc/dec keys or alphanumeric keypad.
4. Press **OK** (F5) to rename or **Cancel** (F2) to cancel the operation.

Reclaim Memory

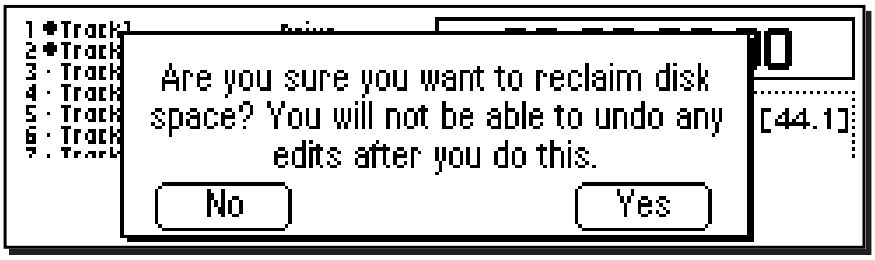
The Reclaim Memory function deletes all undo levels from the current version in order to free up memory for more recording. DARWIN internally saves 16 Undo levels (despite the number of Undo levels set in the Editing Preferences). Therefore, your hard disk will keep filling up as you go through normal recording processes.

When you Reclaim Memory, you free up space on your hard disk by discarding all previous edits and takes. You should reclaim memory periodically as you notice your hard disk filling up.

Warning: After performing this operation you will not be able to undo previous edits in the current version! Reclaim also erases any data that is currently stored on the Clipboard.

▶ To Reclaim Memory:

1. Press the **Version** function key (F4). A pop up menu will appear.
2. Press the **Reclaim** function key (F5). The following dialog box will appear asking you if you are sure.



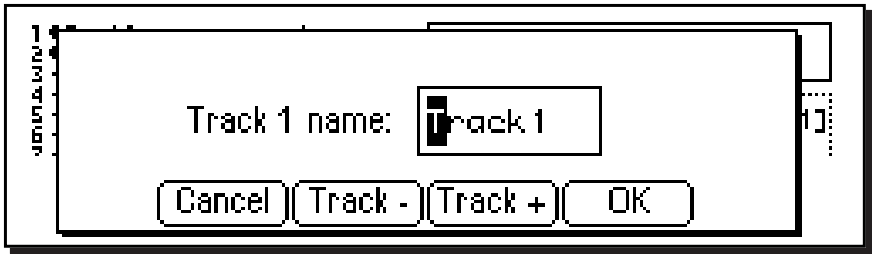
3. Press **OK** (F5) to reclaim memory or **Cancel** (F2) to cancel the operation.

Name Tracks

This function allows you to name each of the eight tracks with up to 10 characters.

▶ To Name the Tracks:

1. Press the **Version** function key (F4). A pop up menu will appear.
2. Press the **Arrow** function key (F6). A pop up menu will appear.
3. Press the **Tracks** function key (F1). The following dialog box will appear.



4. Select the track you wish to name using the (+) function key (F4) to increment the track number or the (-) function key (F3) to decrement the track number.

5. Name the selected track using the jog/shuttle wheels, inc/dec keys or the alphanumeric keypad.
6. Press **OK** (F5) to confirm the track names or **Cancel** (F2) to cancel the operation.

INFO

This window provides important information about the number of Events used in the current Version.

Caution: If the Event Usage percentage becomes too high, you will be prevented from doing any further operations. Check this Info window if Record mode or the Edit functions are prevented from working.

Every time you do a punch-in, punch-out or any edit function, you add **Events** to DARWIN's internal playlist. DARWIN allows approximately 2000 Events per Version. Typically one user action creates several internal events. The 2000 event limit corresponds to about 50 punches on all 8 tracks with crossfade or 150 punches with crossfade turned Off. If you are working on complex projects with multiple punch-ins and edits, you need to be aware of the number of Events you are creating so that you don't run out of event memory.

The top line of the window "Current Event Usage", is the most important value and shows the percentage of the total events you have used. Play Events shows the actual number of events used. The Record Event value relates to the amount of fragmentation present on the hard disk. The values will change depending on the state of the Record Enable buttons.

> • To clear all events from a track you must bounce the track down to another track. See "Bouncing Tracks" in chapter 2 for more information on bouncing.

▶ To Get Event Info on the Version:

1. Press the **Version** function key (F4). A pop up menu will appear.
2. Press the **Arrow** function key (F6). A pop up menu will appear.
3. Press the **Info** function key (F2). The following dialog box will appear.

4. Press **OK** (F5) to return to the main screen.

7 Edit

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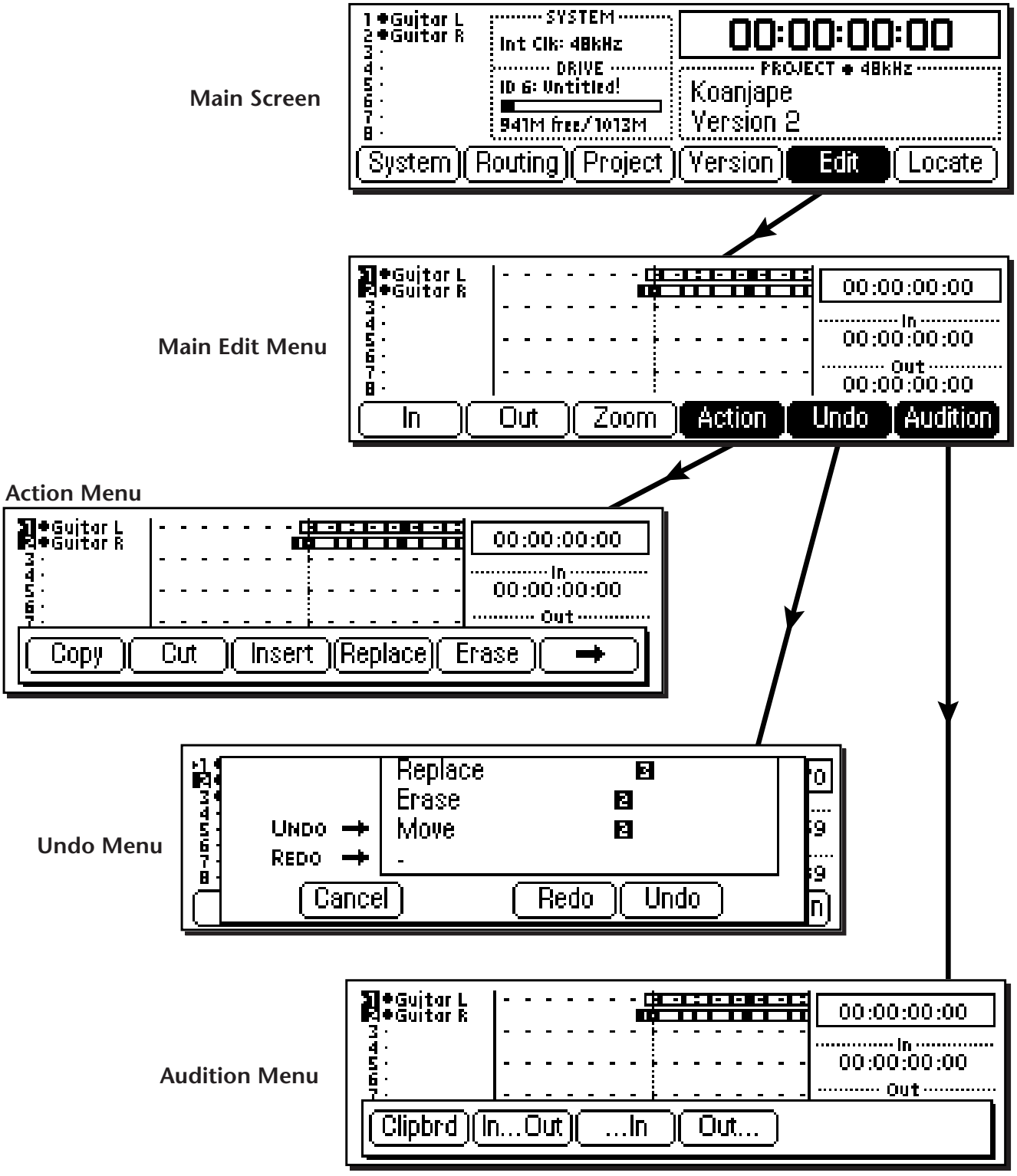
Edit Menus

The power of hard disk recording really becomes apparent when it comes time to edit your recording. DARWIN allows you to digitally cut and paste phrases and tracks to rearrange the song or to repair problems in the performance. The pathways to the various edit menus are diagrammed below.

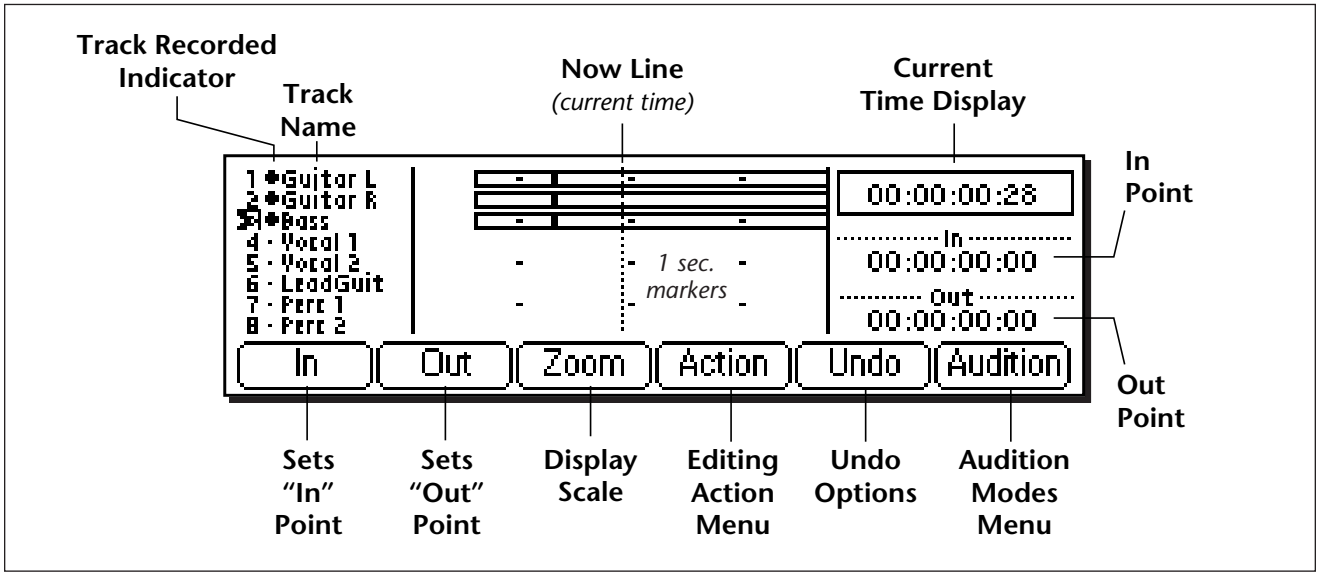


The Edit module contains five main sub menu items:

In/Out	-	Selects the start and end points for the editing operation using the "Now Time" indicator. Allows you select a section of audio to be cut or copied.
Zoom	-	Magnifies the graphic display for more accurate editing.
Action	-	This menu contains the editing functions.
Undo	-	This menu allows you to undo or redo any actions you perform. The number of undos is set in the System, Editing menu.
Audition	-	Allows you to listen to various areas related to your selection before performing an Action.

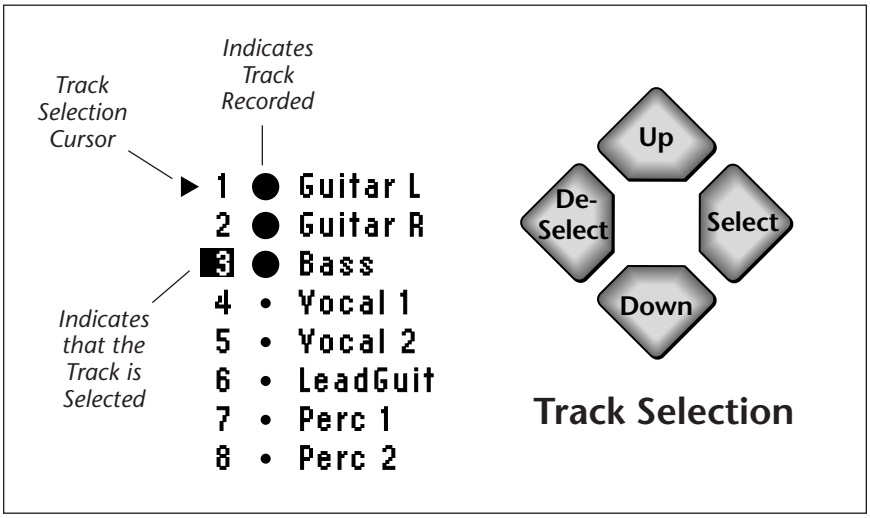
Background: Track Editing Screen

The Track Editing Screen appears whenever you press the Edit function key (F5) from the main menu. The eight track numbers and names (if you have named them in the Version menu) are listed on the left side of the screen. Recorded audio is represented by horizontal bars for each recorded track in the center section of the screen. The **Now Line** shows the current position of the audio tracks. The right section of the screen is devoted to the time display and the in and out point displays. Each dash in the audio display represents one second of time. When DARWIN is in record or play mode, the dash markers and the audio bars move from right to left, graphically representing locations on the virtual "tape". The **Zoom** function key selects one of four levels of display magnification. Multiple presses will return you to the initial setting. The function keys are located at the bottom of the screen.



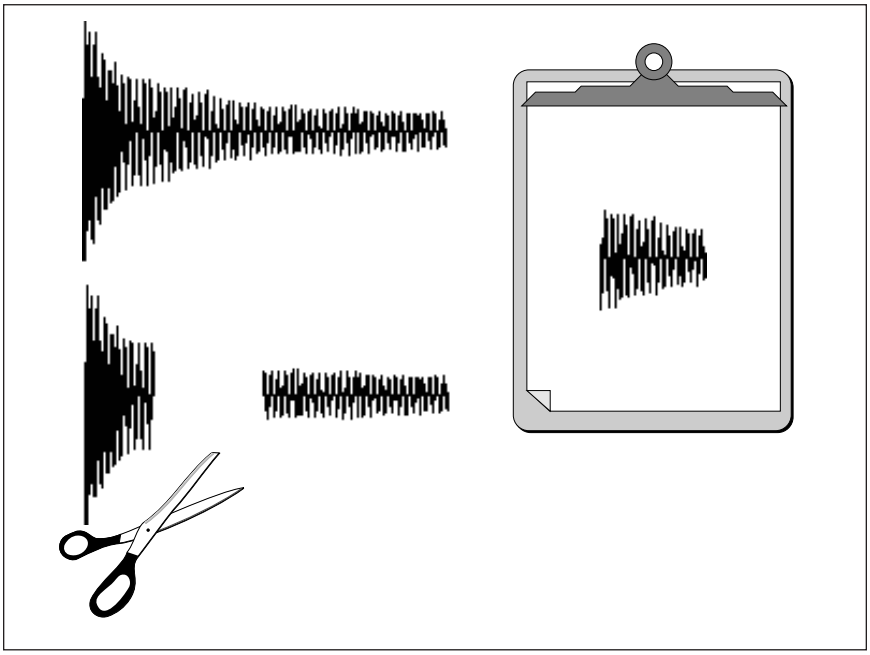
Selecting Tracks

The cursor keys are used to select a specific track or tracks for editing when you are in the track editing screen. The up/down cursor keys move the track selection cursor (visible as a small triangle) up and down alongside the track numbers. The right cursor key selects a track for editing and the left cursor key de-selects a selected track. Selected tracks are indicated by inverted track numbers.



Background: Cut, Copy, & Paste

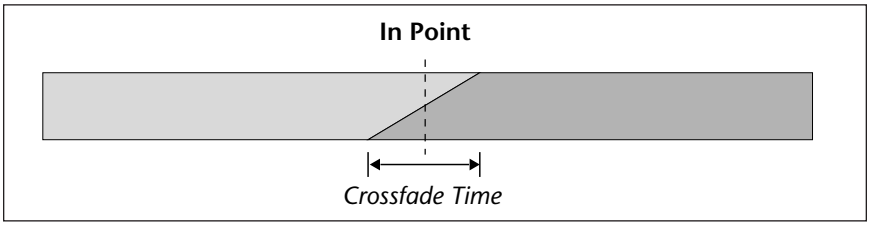
Imagine a printout of a sound. Now imagine that you have a pair of scissors capable of cutting a piece out of that sound (or make a copy of that piece if you don't want to affect the original), as well as a clipboard to neatly hold the cut or copied piece. Now imagine that you can perfectly insert the clipboard contents at any given point in any other sound, starting at any designated point. DARWIN can do all this, and all electronically.



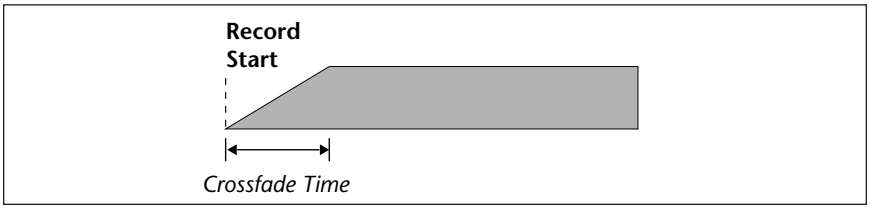
The clipboard will retain data until replaced by other data that is copied or cut.

Crossfading

DARWIN provides a crossfade function which helps to create seamless transitions between cut, copied, and pasted parts. The crossfade time is set in the System, Editing menu. DARWIN uses a **Center Crossfade** in all cases except during the start of recording. When crossfading, the two sections are crossfaded linearly on either side of the splice point as shown in the diagram below.



During the start of recording, the level is faded up beginning at the start of record as shown in the diagram below.

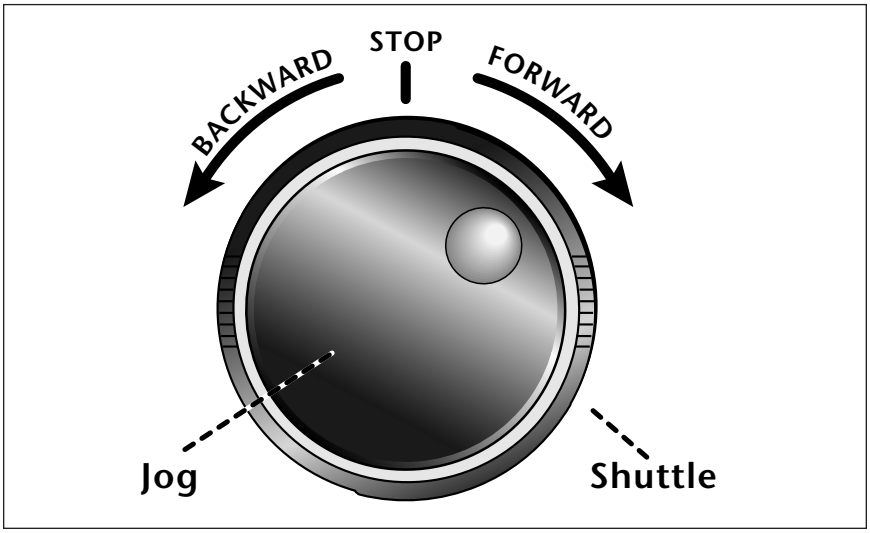


Background: Jog/Shuttle Wheels

The Jog/Shuttle Wheels allows you to move back and forth through the audio data as if you were rocking the reels of a tape recorder. Using the jog/shuttle wheels, you can move slowly through the audio data to find the exact point you wish to edit. The jog wheel is the center of the two wheels. Moving the jog wheel is like manually cranking through the sound, either forward or backwards. The shuttle wheel is spring-loaded and works like a car accelerator pedal. The more you turn it, the faster it goes (in either direction). The Jog and Shuttle wheels only work when the transport is stopped.

Caution: *When using the Shuttle Wheel at 2 times speed, DARWIN isn't able to play all eight tracks. Only the first four tracks play at 2x speed. If you stop, then resume playing at a slower rate, the dropped tracks will return.*

Tip: *It may appear that the virtual "tape" in the edit window is moving the wrong way when you use the shuttle wheel. This is because it is the* **Now** *line that's really moving! Imagine that you are in a car, driving alongside the data.*



JOG/SHUTTLE WHEELS. Rotate the center jog wheel to move slowly through the sound or to find a specific audio event. Use the outer shuttle wheel to move through the sound at variable speeds.

In/Out Point

These two keys set the in and out points which define the section you want to edit. The in/out points can be set during Play or at Stop.

▶ To Set the In and Out Points:

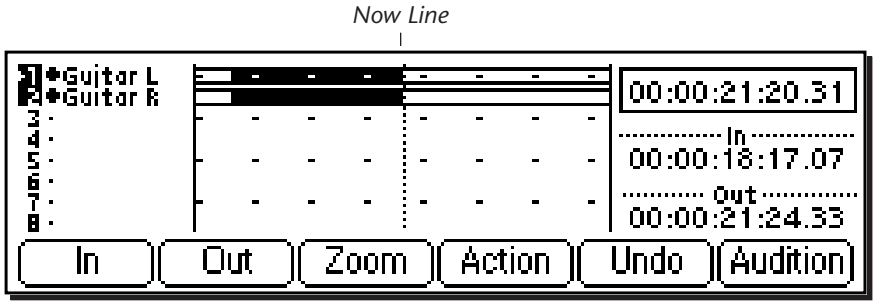
1. Press the **Edit** function key (F5). The edit screen with a new set of function keys will appear.
2. Select the track or tracks you wish to edit using the cursor keys. The right cursor selects and the left cursor de-selects the track. The up/down cursor keys move the track selection cursor.
3. Select the location for the **In** point using the transport controls, the GoTo or Locate keys, or by rotating the jog/shuttle wheels. The exact location you want should be lined up with the **Now** line in the center of the display.
4. Press the **In** function key (F1).
5. Select the location for the **Out** point using the transport controls or by rotating the jog/shuttle wheels. The exact location you want should be lined up with the **Now** line. The selected section will be inverted (white->black/black->white). (Note: The Out point must always be after the In point.)

Tip: *To select the entire track: Hold the **In** key and press the **Out** key at the same time.*

To Move to the Beginning of a Track: *Press the **Dec** key.*

To Move to the End of a Track: *Press the **Inc** key.*

Tip: *See Background: Track Editing Screen, at the beginning of this chapter for information on track selection.*



6. You can now move on to the Audition menu if you want to hear the selected section or to the Action menu if you are ready to edit the section.

Zoom

This button magnifies the track display by 2x each time it is pressed. On the fourth press, the display returns to low resolution. (1x, 2x, 4x, 8x, 1x, 2x, etc.) Note that each dot of the horizontal dotted lines represents one second.

▶ To Zoom the Display In and Out:

1. Press the **Edit** function key (F5). The edit screen with a new set of function keys will appear.
2. Press the **Zoom** function key (F3). The display resolution will be magnified by two.
3. Continue to press the Zoom key until the desired resolution is achieved. The key rotates through three levels of magnification, then back to normal.

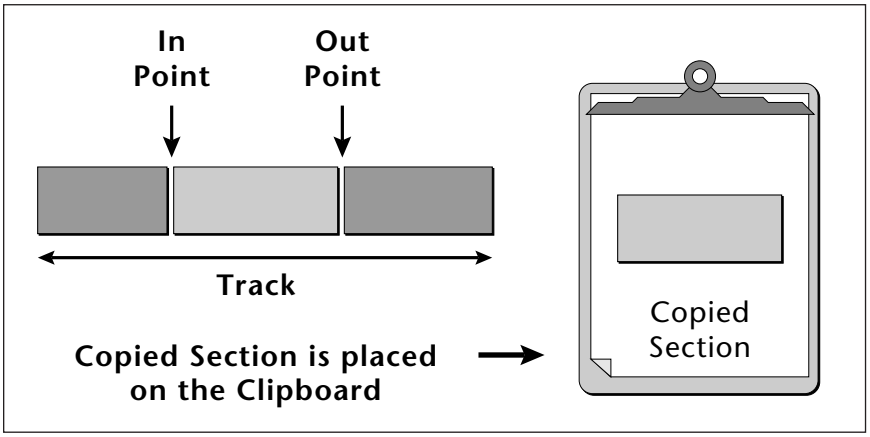
Action

The Action menu contains the actual editing functions. Once you have selected a section, you can perform an action on that section. If multiple tracks are selected the action will be performed on all of them.

Copy	Copies the selected section to the clipboard.
Cut	Removes the selected section and places it on the clipboard. Audio data after the cut moves earlier to fill the gap.
Insert	Inserts the clipboard contents at the selected start point and moves the original audio to make room for the inserted audio.
Replace	Inserts the clipboard contents at the selected start point and replaces the original audio in that area with the inserted audio.
Erase	Erases the selected section, leaving silence in its place.
Extend	Adds silence between the selected In and Out points and moves the original audio towards the end of the project.
Move	Moves the selected section by a designated amount of time. The moved section replaces any data it overlaps as a result of the move.

Copy

Portions of a track can be cut, copied and pasted to other sections of the track or to other tracks. The Copy function allows you to **duplicate** a section of the track and store a virtual copy of that section on the clipboard where it can be transferred to another track or location.



Tip: *Use the Audition Clipboard function to hear the section that was copied.*

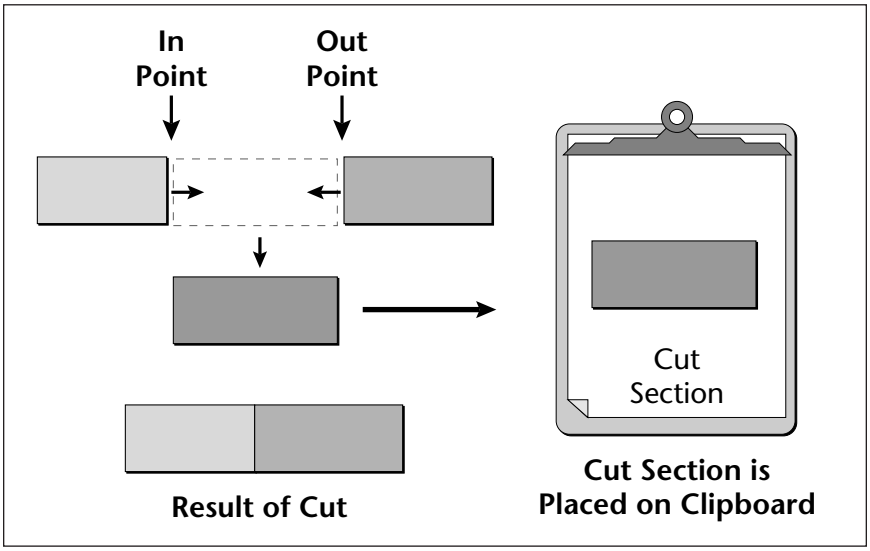
▶ To Copy a Section:

1. Press the **Edit** function key (F5). The edit screen will appear.
2. Select the track or tracks you wish to copy using the cursor keys.
3. Select the **In** and **Out** points for the section you wish to copy.
4. Press the **Action** function key (F4). Another row of function keys will appear.
5. Press the **Copy** function key (F1). A status window in the display will briefly say, "Processing", and the selected section will be copied to the clipboard.

Cut

The Cut function allows you to **remove** a section of the track and store that portion on the clipboard. After cutting the section out, the remaining parts of the track are connected together and crossfaded using the crossfade time set in the System, Edit menu.

Tip: *Experienced Editors cut at the beginnings of notes in order to keep the rhythm accurate.*



Tip: *Use the Audition Clipboard function to hear the section that was cut.*

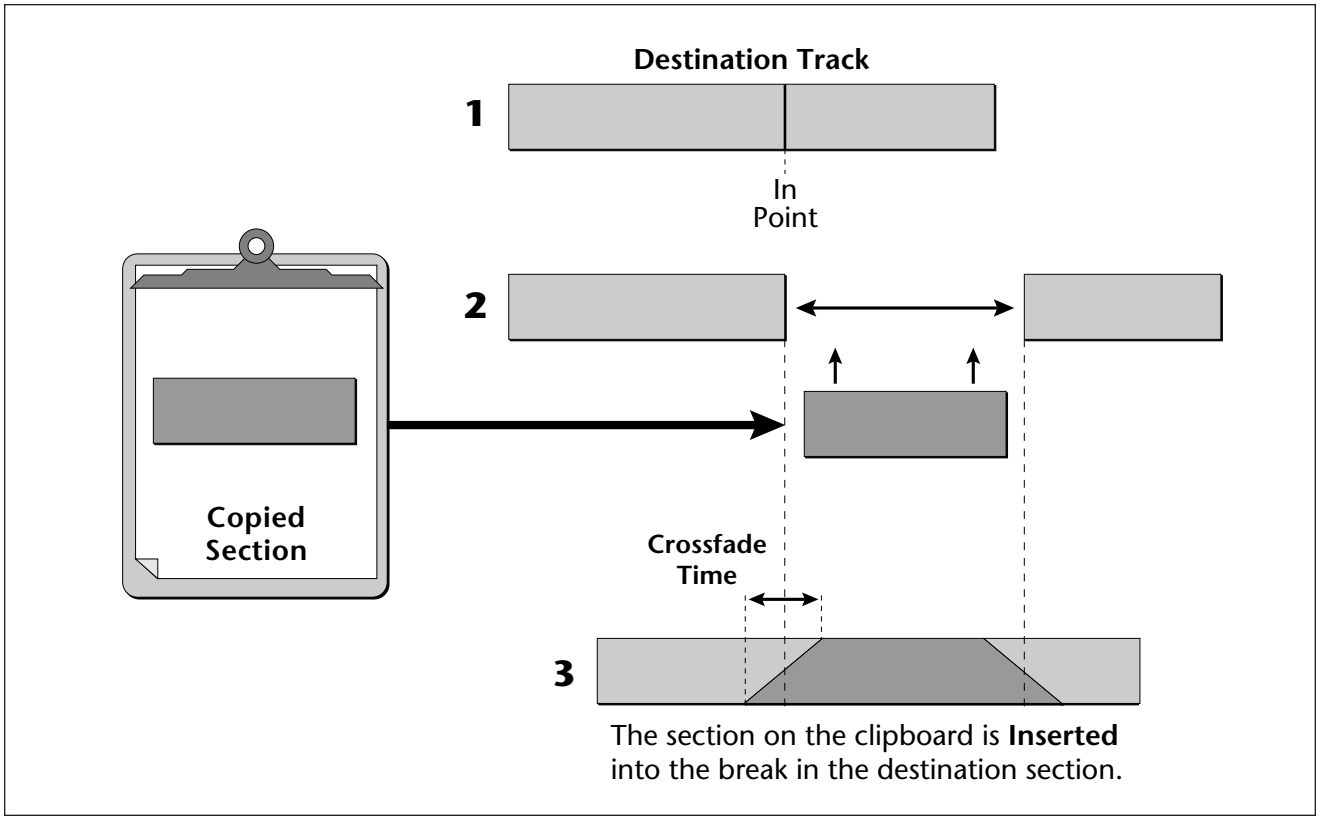
▶ To Cut a Section:

1. Press the **Edit** function key (F5). The edit screen will appear.
2. Select the track or tracks you wish to cut using the cursor keys.
3. Select the **In** and **Out** points for the section you wish to cut.
4. Press the **Action** function key (F4). Another row of function keys will appear.
5. Press the **Cut** function key (F2). A status window in the display will briefly say, "Processing", and the selected section will be cut to the clipboard. The remaining sections of the track(s) will be spliced or crossfaded back together.

Tip: *Use Crossfades to avoid clicks due to misaligned waveforms in the cut track. Crossfade time can be adjusted under Edit in the System menu.*

Insert

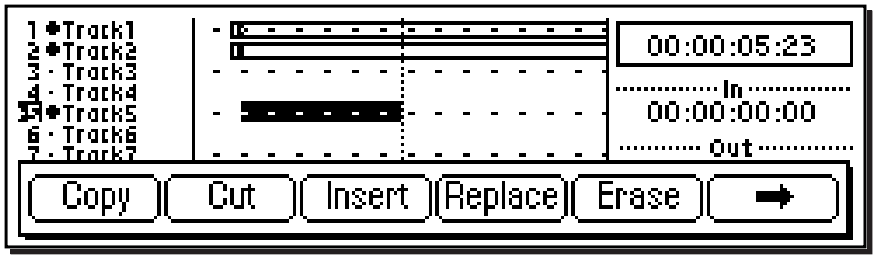
The Insert function takes the contents of the clipboard and inserts it at the selected start point. The original audio data is moved ahead to make room for the clipboard data.



▶ To Insert a Section:

1. Press the **Edit** function key (F5). The edit screen will appear.
2. Select the destination track or tracks for the audio on the clipboard.
3. Select the **In** point where the section will be inserted.
4. Press the **Action** function key (F4). A pop up menu will appear.

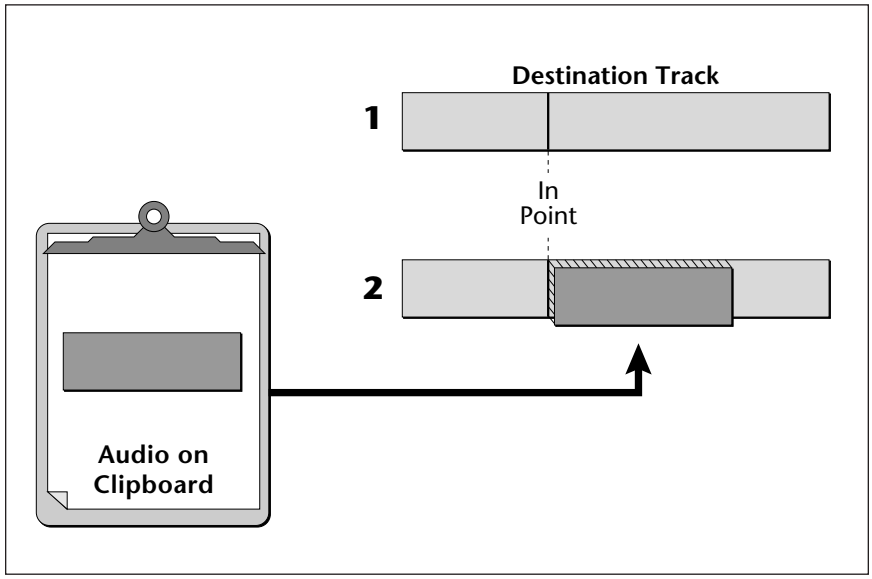
Tip: *If you copied more than one track to the clipboard and insert into a single track, only the first track will be inserted.*



5. Press the **Insert** function key (F3). A status window in the display will briefly say, "Processing", and the section will be inserted into the existing audio. The sections of the track(s) will be spliced or crossfaded back together.

Replace

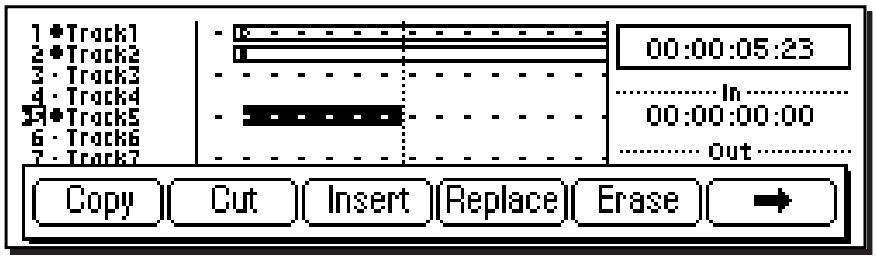
The Replace function takes the contents of the clipboard and inserts it in place of the audio data at the selected start point.



Tip: *If you copy more than one track to the clipboard and replace into a single track, only the first track will be replaced.*

▶ To Replace a Section:

1. Press the **Edit** function key (F5). The edit screen will appear.
2. Select the destination track or tracks for the audio on the clipboard.
3. Select the **In** point where the section will replace the existing audio (the Out point is ignored).
4. Press the **Action** function key (F4). Another row of function keys will appear.

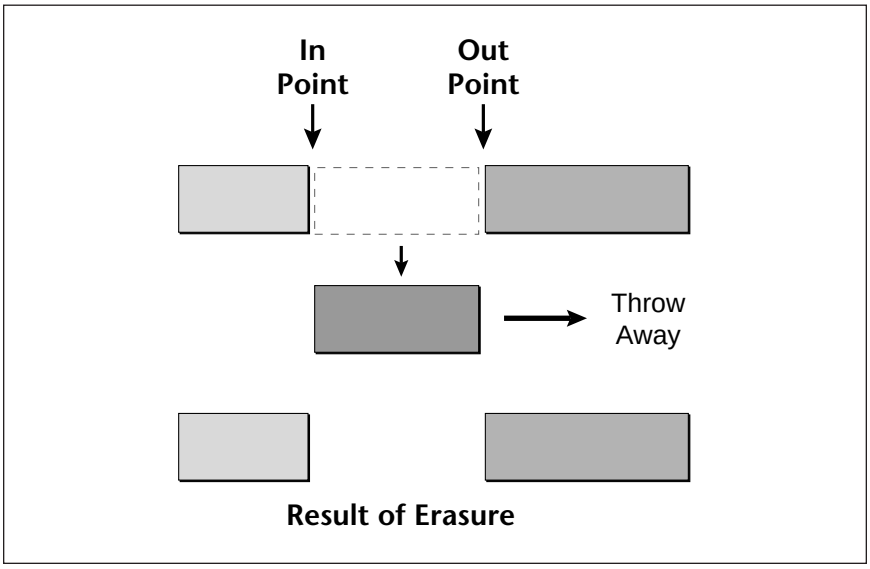


5. Press the **Replace** function key (F4). A status window in the display will briefly say, "Processing", and the section will be replace the existing audio beginning at the start point.

Erase

This function simply erases the selected section, leaving silence in its place. The data is NOT placed on the clipboard. Use Erase when you want to throw away a section or an entire track.

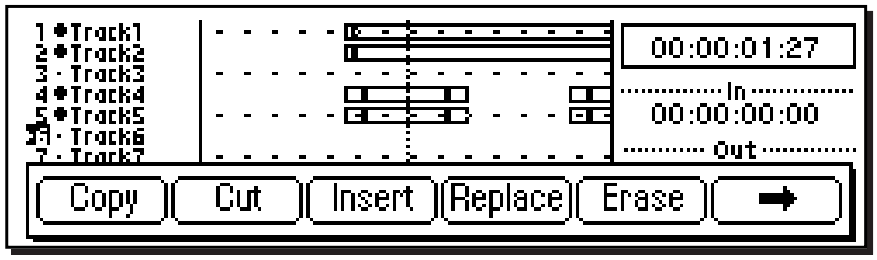
Tip: *To select the entire track: Hold the **In** key and press the **Out** key at the same time.*



Tip: *When a track has been completely erased, the track recorded indicator will change to a small dot. If the larger dot is still visible, you have not erased all the audio on the track.*

▶ To Erase a Section:

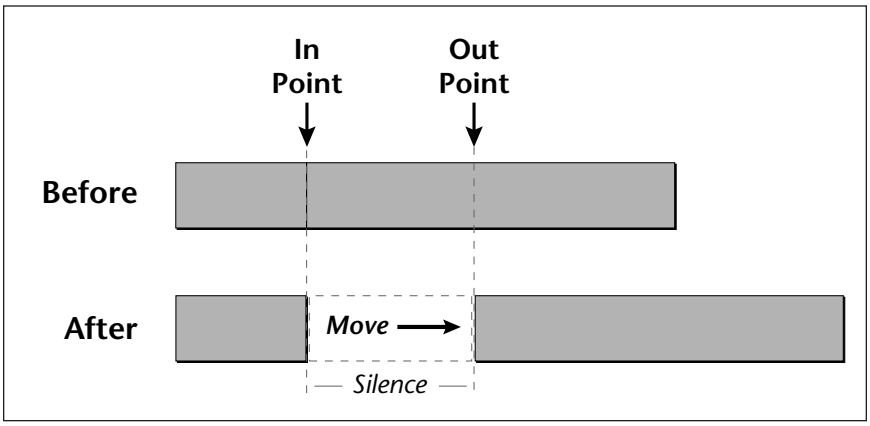
1. Press the **Edit** function key (F5). The edit screen will appear.
2. Select the track or tracks you wish to erase using the cursor keys.
3. Select the **In** and **Out** points for the section you wish to erase.
4. Press the **Action** function key (F4). Another row of function keys will appear.



5. Press the **Erase** function key (F5). A status window in the display will briefly say "Processing", and the section will be erased, leaving silence in its place.

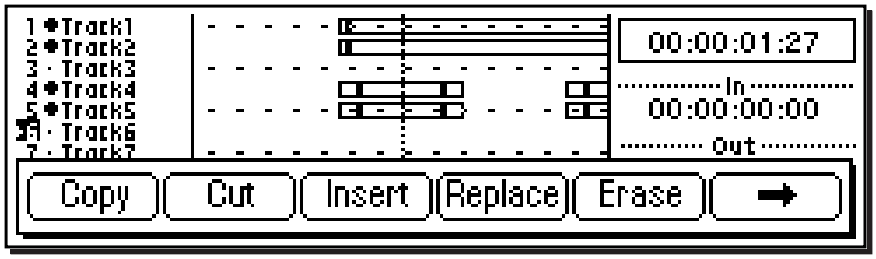
Extend

This function inserts silence into the selected section, The audio data after the selected section is moved forward by the same amount to make room for the silence. This function is like adding a piece of leader on a tape recorder.



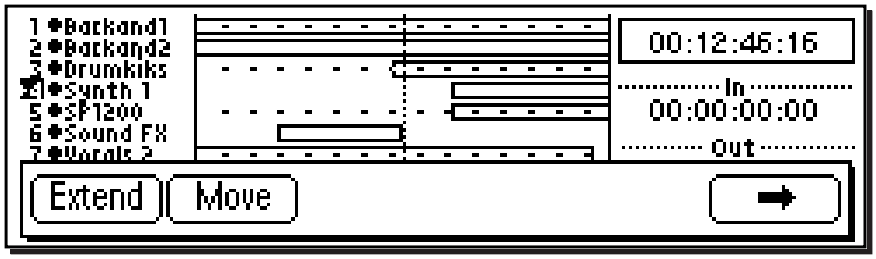
▶ To Extend a Section:

1. Press the **Edit** function key (F5). The edit screen will appear.
2. Select the track or tracks you wish to extend using the cursor keys. *See Background: Track Editing Screen*.
3. Select the **In** and **Out** points to define the length of the extension.
4. Press the **Action** function key (F4). A pop up menu will appear.



Tip: *Pressing the arrow function key (F6) reveals more editing choices. Keep pressing the arrow key to return to previous menus.*

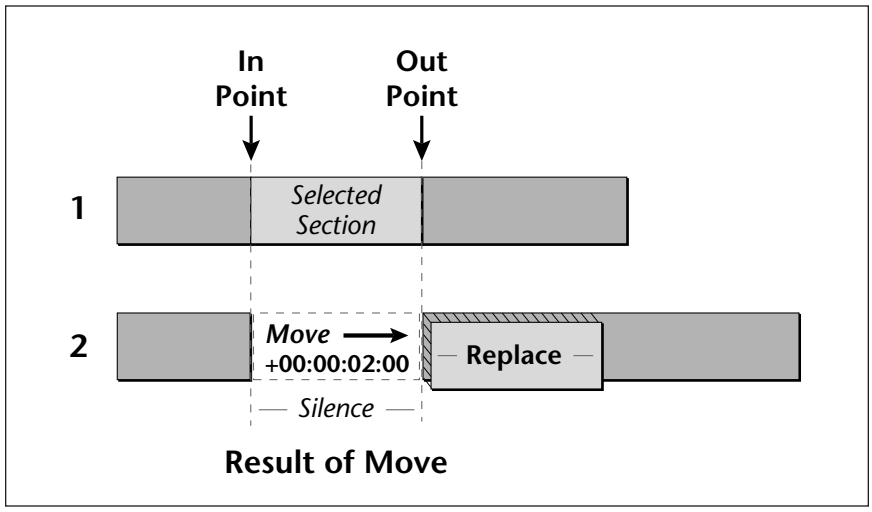
5. Press the **Arrow** function key (F6). Another row of function keys will appear.



6. Press the **Extend** function key (F1). A status window in the display will briefly say, "Processing", and the section will be filled with silence and the audio at that location moved forward by an amount equal to the selected section.

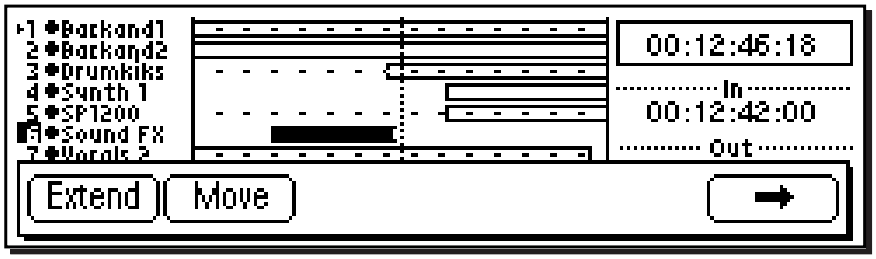
Move

This function moves a selected section by a programmable amount of time forward or backwards. The moved section replaces any audio data that it overlaps as a result of the move.

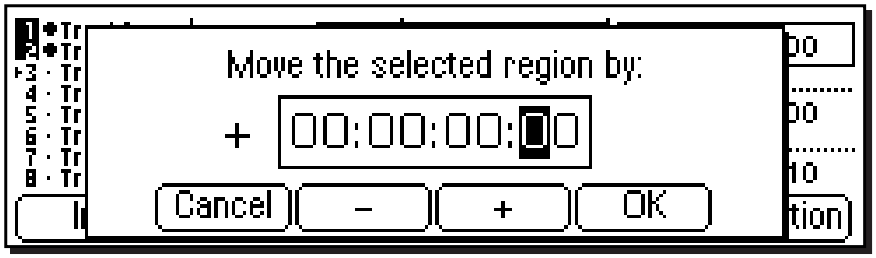


▶ To Move a Section:

1. Press the **Edit** function key (F5). The edit screen will appear.
2. Select the track or tracks you wish to move using the cursor keys.
3. Select the **In** and **Out** points for the section you wish to move.
4. Press the **Action** function key (F4). A pop up menu will appear.
5. Press the **Arrow** function key (F6). A pop up menu will appear.



6. Press the **Move** function key (F2). A pop up window in the display will appear.



Tip: *Change the Display Mode setting in the System -> Clock menu to move the region by subframes, milliseconds or samples.*

7. Enter the amount of offset using the numeric keypad, inc/dec keys, or jog/shuttle wheels. Use the left and right cursor keys to position the cursor over the proper field. Use the plus/minus function keys (F3 & F4) to select whether the region will be moved forward or backwards.
8. Press **OK** to move the selection or **Cancel** to cancel the operation.

Undo

DARWIN backs up ALL editing and record operations! Think of it. Every change you make can be undone. This powerful feature frees your creativity because you can always go back to a previous version of your work. You can set DARWIN to keep 1 to 16 Undo levels *(See System, Editing)*. Old versions can be discarded permanently if you wish by using the Reclaim Memory feature *(Located under Version, Reclaim)*.

The power of this module becomes apparent when you want to go back several steps and retrieve something you have since changed, Easy, since you have several undo levels set. Just undo the edits until you're back at the step you wanted, then copy the tracks onto a new version. Now use the Redo function to bring everything back to its original state.

▶ To Undo an Action:

1. Press the **Edit** function key (F5). The edit screen will appear.
2. Press the **Undo** function key (F5). The screen shown above will appear.
3. A list of your edits will be shown. Press the **Undo** function key (F5) to undo the previous edit. Press the **Redo** function key (F4) to redo the previous undo. The exact number of possible "undos" is dependent on the number of undo levels you have set in the System, Editing submenu.
4. Press **Cancel** to cancel the window and return to the Edit screen.

Caution: *You have multiple layers of Undo, but only one layer of Redo. This means that if you Undo your most recent edit, you can still undo it, but if you perform another Action after the Undo, all previous undos will be lost.*

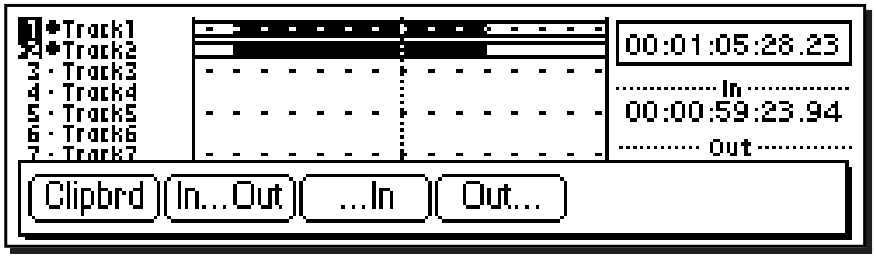
Audition

This menu contains several options for auditioning tracks. These functions are extremely useful when editing as they allow you to preview the results of an edit before it is actually performed. The audition options are listed below.

Clipboard	Auditions the contents of the clipboard.
In...Out	Auditions the section between the selected In and Out points (the selected section).
...In	Auditions a section beginning 2 seconds before the In point and ending at the In point.
Out...	Auditions a section beginning at the Out point and ending 2 seconds after the Out point.

▶ To Audition a Section:

1. Press the **Edit** function key (F5). The edit screen will appear.
2. Select the track or tracks you wish to audition using the cursor keys.
3. Select the **In** and **Out** points for the section you wish to audition.
4. Press the **Audition** function key (F6). Another row of function keys will appear.



5. Press the desired audition function. Playback will begin immediately.
6. If you want to abort the audition, press **Stop** at any time.

8 Locate

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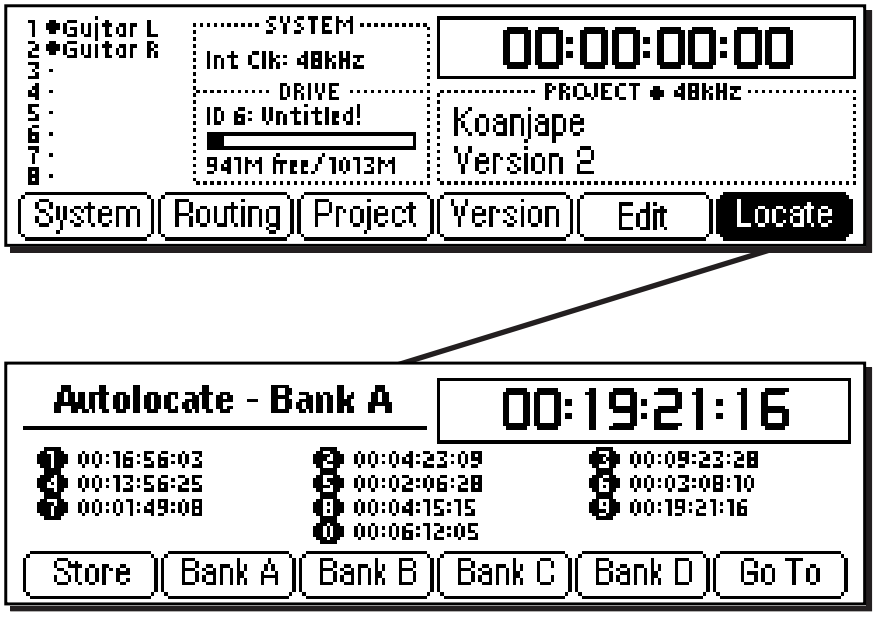
Autolocate Points

Autolocate points allow you to jump instantly to a precise point in a song. DARWIN has the ability to store up to 40 Autolocate points per Version! The Autolocate points are arranged in four banks of ten, so that one bank of ten Autolocate points is accessible directly from the front panel at any time.

Main Screen



Storing a Location from the Front Panel

This function stores an Autolocate point in the current bank. The Autolocate point stored is always the current location.

▶ To Store a Location in the Current Bank:

1. Go to the desired location in the song.
2. Press the **STO LOC** key. The following dialog box will appear.

3. Press the numeric key where you want to store the location point. The location will instantly be stored.
4. Press Cancel (F2) to cancel the operation.

Locating to a Stored Point

This function instantly jumps to one of the stored Autolocate points in the current bank. This function works in any window where the transport is enabled (indicated by any of the transport LEDs being lit.).

▶ To Locate to a Specific Point:

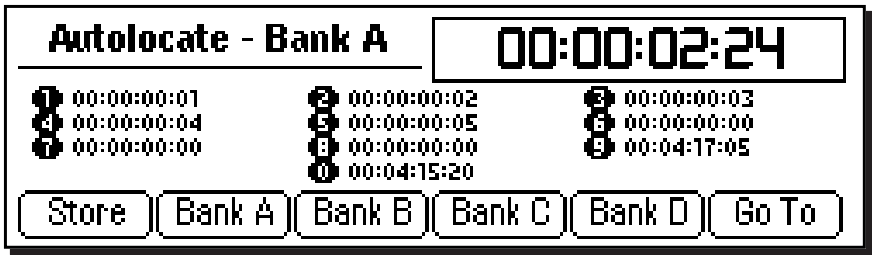
1. Press the numeric key corresponding to the desired Autolocate point.
2. DARWIN instantly jumps to the stored location.

Storing a Location from the Locate Window

The Locate window allows you to store Autolocate points in any of the four banks. You can also select which bank of 10 Autolocate points will be accessible from the numeric keypad.

▶ To Store a Location from the Autolocate Screen:

1. From the main screen, press the **Locate** function key (F6). The Autolocate screen will appear.



2. Press the **Store** function key (F1). The dialog box shown below will appear.

3. Press the numeric key corresponding to the location in which you want to store the locate point. The number in the window will change.
4. Press **OK** (F5) to store the Autolocate point or **Cancel** (F2) to cancel the operation.

▶ To Change the Autolocate Bank:

This function allows you to change the bank of locate points which will be available from the front panel numeric keypad.

1. From the main screen, press the **Locate** function key (F6). The Autolocate screen will appear.
2. Press one of the **Bank** function keys (F2, F3, F4, F5). The bank number will change to the selected bank.
3. Press **Exit** to return to the main screen.

Locating to a Specific Point

This function instantly jumps to a specific point in the song.

▶ To Locate to a Specific Point from the Autolocate Screen:

1. Press the **Go To** function key (F6). The following dialog box will appear.

The type of readout shown in this display depends on the clock setting located under System -> Clock.

2. Enter the desired location using the numeric keypad, inc/dec keys, jog/shuttle wheels and up/down cursor keys. Use the left/right cursor keys to move the cursor to the next field.
3. Press the **OK** function key (F5) to immediately jump to the entered location. Press **Cancel** (F2) to cancel the operation and maintain the current location.

▶ To Locate to a Specific Point from the Front Panel:

1. Press the **Go To** key on the lower right of the numeric keypad. The dialog box shown above will appear.
2. Enter the desired location using the numeric keypad, inc/dec keys, jog/shuttle wheels and up/down cursor keys. Use the left/right cursor keys to move the cursor to the next field.
3. Press the **OK** function key (F5) to jump immediately to the entered location. Press **Cancel** (F2) to cancel the operation and maintain the current location.

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SCSI

SCSI (pronounced skuzzy) stands for Small Computer System Interface. SCSI is an industry standard hardware and software specification that allows high-speed data transfers between different pieces of equipment. SCSI devices can include hard disks, tape drives, optical disks and other types of digital equipment.

Why Use SCSI?

- **SCSI is fast!** SCSI is a parallel interface which transmits eight bits of information at a time at high speed over the SCSI cable. MIDI, in comparison, is a serial interface which can only send one bit of information at a time over its line.
- **Compatibility:** Since SCSI is an industry standard, equipment from many different manufacturers can be linked to work together.
- **Expandability:** Up to eight SCSI devices can be linked together (DARWIN counts as one SCSI device on the chain, so you can add up to seven additional SCSI devices).

The SCSI Bus

You may have noticed that the rear panel of most external storage devices have two SCSI connectors. This is because SCSI devices are connected together in a chain arrangement. The wires that connect the different pieces of equipment are called the SCSI bus. DARWIN contains two separate SCSI busses: the Audio SCSI Bus and the Host Computer SCSI bus. The Audio SCSI bus is used to connect drives used to store audio data. The optional Host Computer SCSI port is used to connect to a personal computer.

ID Numbers

Each device on the SCSI bus has its own ID number so that it can distinguish its data from data meant for another device. If data is being saved to a device with ID-2 for instance, all the other devices on the SCSI bus will ignore that data. If two devices have the same ID number, the system **will not work**. Each device must have its own unique ID number.

Many SCSI devices have hardware defined ID numbers, which means that they have a switch on the front or the back of the unit which allows the ID number to be easily identified and changed.

Caution: *When 2 devices have the same ID, DARWIN will produce a "Disk Interface Timeout" message and may not function properly.*

Also, if a device is on the SCSI bus with the same ID as DARWIN (fixed at ID 7), the disk browser will report ALL IDs as on line. This is a limitation of SCSI and cannot be helped.

The following is a list of the default SCSI ID numbers for the Audio SCSI bus:

ID - 7 (fixed)	DARWIN
ID - 6	Unassigned
ID - 5	Unassigned
ID - 4	Jaz Drive (if installed)
ID - 3	Unassigned
ID - 2	Unassigned
ID - 1	Unassigned
ID - 0	Internal DARWIN HD (model 4001 only)

Types of SCSI Cables

There are two basic types of SCSI cables in use: DB25 and 50-pin Centronics. The two types of cable can be identified by their connectors, which are quite different. When buying SCSI extension cables, it is important to choose ones with the right type of connectors, since the two types will not interconnect without a special adapter. DB25 connectors are the type commonly found on the back of personal computers. The SCSI connectors on the DARWIN SCSI ports are the 50-pin Centronics type. **Use only high quality shielded cables that have all the pins connected. Many cables only have some of the pins wired.**

Terminating SCSI Cables

The total length of the SCSI chain should not exceed 15 feet. A general rule for SCSI cables is: **The Shorter the Better!**

Terminating resistors (or terminators) are special resistor packs that are installed on the **first and last device in the SCSI chain**. Terminators are used to reduce line echoes or standing waves on the SCSI bus. An analogy in an audio system would be impedance matching.

Terminators can either be hidden inside a SCSI device or they can take the form of termination blocks which can simply be plugged into the SCSI port.

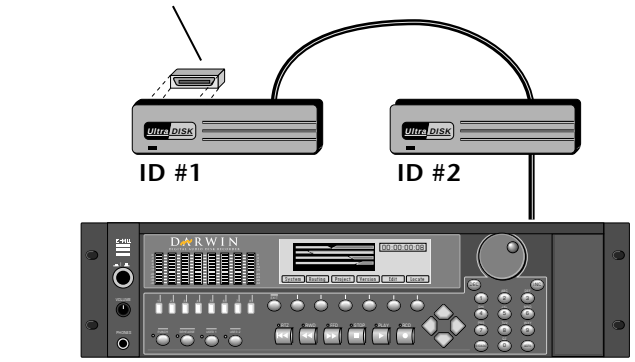
IMPORTANT: DARWIN model 4001, which contains an internal hard disk, is supplied with an external termination block which should be attached to the rear panel Audio SCSI Port if no external SCSI devices are connected. If you have one or more external SCSI devices connected to a model 4001, the supplied terminator block should be connected to the last SCSI device in the chain.

Terminators apply power to an array of resistors to ensure a full 5 volt swing between high and low levels on the SCSI line. The host system is required to provide Termination Power. Termination power has its own wire in the SCSI cable and supplies power to the termination block. On external hard disk drives, SCSI terminator power is almost always turned Off and the drives are left un-terminated.

DARWIN is shipped with termination power On and internal termination resistors On. This assumes that the DARWIN will be placed at one end of the SCSI chain. **DARWIN has an automatic system which ONLY supplies terminator power when it is NOT being**

supplied by another device. Therefore, you do not need to worry about terminator power when connecting DARWIN.

The more devices you have connected to SCSI and the longer your cables are, the more it becomes important to have the cables properly terminated.



DARWIN is ID #7
DARWIN model 4001 - Internal Drive = ID #0

SCSI Problems

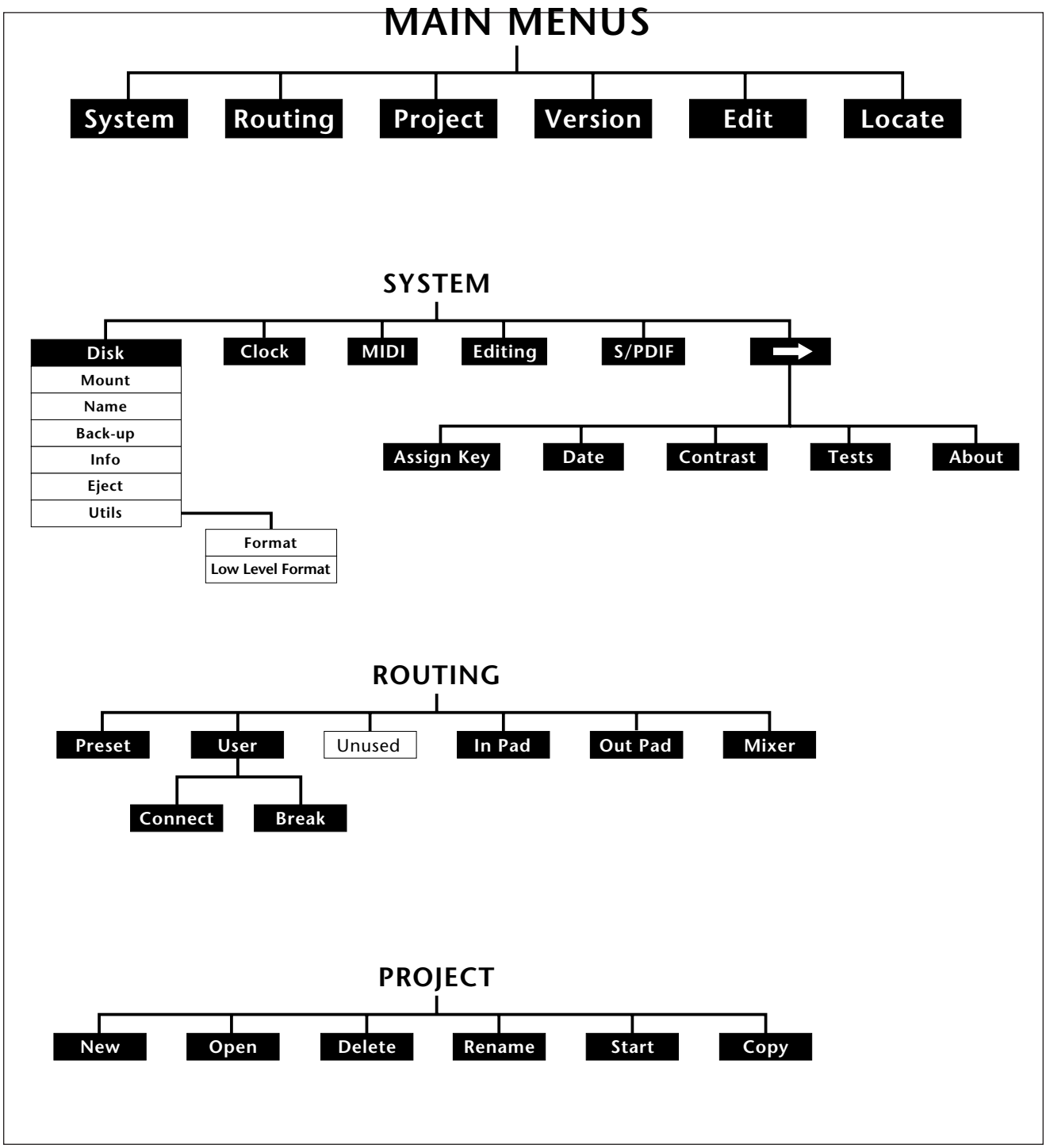
In diagnosing SCSI problems the first rule is: Don't panic, experiment! If you have several SCSI devices hooked up, **first check the SCSI ID numbers for conflicts**, then try disconnecting one of the devices and maybe change the order of the units on the line. There are quite a number of different SCSI drives on the market each with slightly different electrical characteristics. The following checklist may help you find the solution to your unique SCSI setup.

1. **Make sure the drive is mounted.** Mount the drives using the Mount Drive utility (System, Disk).
2. **Check the SCSI ID numbers.** No two numbers on the bus can be the same.
3. **Are the ends of the SCSI bus terminated?**
4. **Read the documentation again.** Learn all you can about your peripheral devices. The answer to your problem may be right in front of you.
5. **Play with the order in which devices are powered up.** Normally the "Big Bang" method works best (turn everything on at once), but another order may work better in your unique system. Experiment!

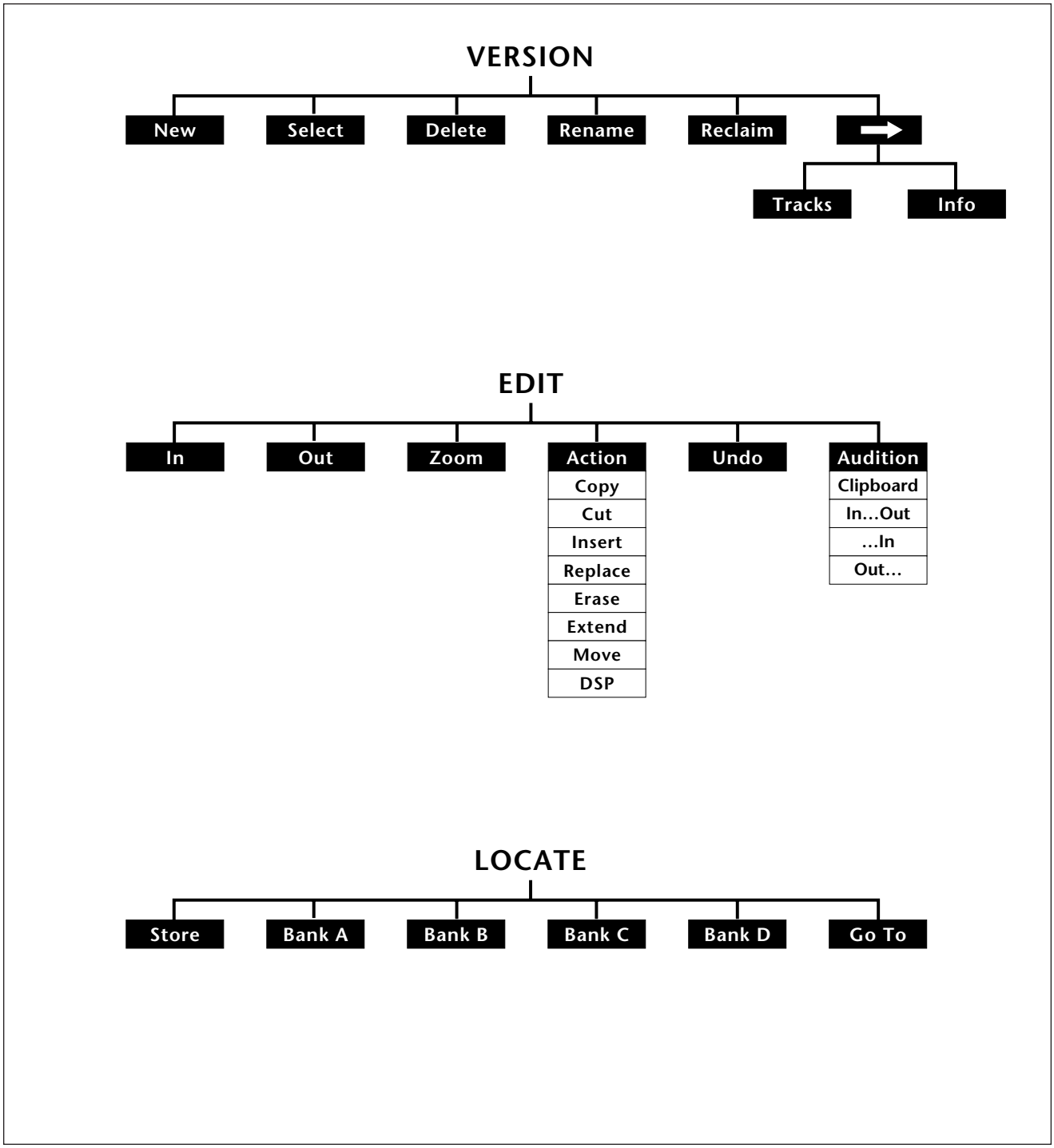
*Exception to the Big Bang **Method:** Power up the SCSI DAT drive FIRST and wait a second before powering up DARWIN.*

6. **Always suspect the cable when something doesn't work on the SCSI bus.** Remember: The shorter the cables are, the better.
7. **Simplify the situation.** Disconnect one or more drives until you get the system to work.
8. **If all else fails, call us.** We're here if you need us. 408-438-1921 Telephone support hours are 9:00 to 5:00 PST, Monday - Friday.

DARWIN
Menu Maps



DARWIN
Menu Maps



LED Indicator Chart

This chart reveals the meaning of DARWIN's LED status indicators as they relate to different modes of operation.

"**Pseudo-rec**" refers to the state in which DARWIN has been told to record, but cannot, either because tracks have not been enabled, rehearse mode is selected, or an illegal operation has been requested (such as a second punch-in). Flashing LEDs indicate that DARWIN is not ready or is prevented from engaging the requested operation.

"**Rebuffering**" refers to the state at the end of a record operation when DARWIN is organizing its file system. In this case, the record LED flashes quickly to indicate internal activity.

"**Record-Pause**" is a mode supported when DARWIN is a slave controlled by MMC. This mode is not available from DARWIN's front panel.

DARWIN

● = LED Solid

✺ = LED Flashing

	MASTER		SLAVE	
	Play	Record	Play	Record
Slave Chasing	●	—	✺ 2Hz	—
All Locked (play)	●	—	●	—
Slave Chasing (rec)	●	●	✺ 2Hz	✺ 2Hz
All Locked (rec)	●	●	●	●
Chase (pseudo-rec)	●	✺ 2Hz	✺ 2Hz	✺ 2Hz
Locked (pseudo-rec)	●	✺ 2Hz	●	✺ 2Hz
Punch Out (rebuffering)	●	✺ 8Hz	●	✺ 8Hz
Punched Out	●	✺ .5Hz	●	✺ .5Hz
MMC ONLY				
Record-Pause	✺ 1Hz	✺ 1Hz	—	—
Jog/Shuttle	●	—	—	—

Specifications

Number of Tracks	8
Max. Size of Hard Disk	2 GB (approx. 405 track minutes)
Analog Inputs	4, 1/4 " TRS balanced, *(8 with optional Analog Input card)*
Analog Outputs	8, 1/4" TRS balanced.
Input Level	-10dBu or +4 dB, switchable.
Output Level	-10dBu or +4 dB, switchable.
Input Impedance	10 KΩ
Output Impedance	600Ω
Data Encoding	Input: 16-bits Output: 18-bits
Digital I/O	S/PDIF or AES/EBU formats, RCA connectors *(ADAT 8-channel Digital Optical Interface with optional card)*
Audio SCSI	50 pin connector
Sample Rates	44.1 kHz or 48 kHz
Frequency Response	20 Hz to 20 kHz, +1/-1 dB at 44.1 kHz sample rate
THD + N	< 0.05% (1kHz sine wave, A-weighting)
THD	< 0.03%
Signal/Quiescent Noise	> 100 dB
Phase	Phase Coherent ±1° at 1 kHz.
Weight	17 lbs (7.7 kg)
Dimensions	**W**: 17.125" (43.5 cm) **H**: 5.25" (13.3 cm) **L**: 13.25" (33.6 cm)
Power	100-240 VAC, 50/60 Hz, auto-select, less than 50 watts

MIDI Implementation Chart

Function...	Transmitted	Recognized	Remarks
Basic Default Channel Changed	No No	No No	
Mode Default Messages	No	No	
Note Number True Voice	No No	No No	
Velocity Note ON Note OFF	No No	No No	
After Keys Touch Channels	No No	No No	
Pitch Bender	No	No	
Control Change	No	No	
Bank Select	No	No	
Program Change True Number	No No	No	
All Sound Off	No	No	
All Notes Off	No	No	
Reset All Controllers	No	No	
System Exclusive	Yes	Yes	
MIDI Time Code	Yes	No	
MIDI Machine Code	Yes	Yes	
MIDI Sample Dump	No	No	
System :Song Pos Common :Song Sel :Tune	No No No	No No No	
System :Clock Real Time :Commands	No No	No No	
Aux :Local On/Off Messages :Active Sense :Reset	No No No	No No No	
Notes:			

Warranty

Please read this warranty, as it gives you specific legal rights.

Length of Warranty

Your DARWIN warranty covers all defects in materials and workmanship for a period of one year from the date of purchase by the original owner, provided that the Warranty Registration Card is filled out and returned to E-mu Systems within 14 days from the date of purchase. Cases may arise where E-mu's Service Department or one of E-mu's authorized service centers will ask for a copy of your sales receipt to facilitate warranty service. Please keep your purchase receipt in a safe place.

E-mu Systems does not cover:

- Damages due to improper or inadequate maintenance, accident, abuse, misuse, alteration, unauthorized repairs, tampering, or failure to follow normal operating procedures as outlined in the owner's manual.
- Deterioration or damage of the cabinet.
- Damages occurring during any shipment of the DARWIN for any reason.
- A DARWIN that has in any way been modified by anyone other than E-mu Systems, Inc.

Limitation of Implied Warranties

No warranty is expressed or implied. E-mu Systems specifically disclaims the implied warranties of merchantibility and fitness for a particular purpose.

Exclusion of Certain Damages

E-mu Systems' liability for a DARWIN found defective is limited to repair or replacement of the unit at E-mu's option. In no event shall E-mu Systems be liable for damages based on inconvenience, whether incidental or consequential, loss of use of the unit, loss of time, interrupted operation or commercial loss, or any other consequential damages.

Some states do not allow limitation of the duration of implied warranties or the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

How To Obtain Warranty Service

All E-mu products are manufactured with the highest standards of quality. If you find that your instrument does require service, it may be done by any authorized E-mu service center. If you are unable to locate a service center in your area, please contact E-mu Systems Service Department at (408) 438-1921. They will either refer you to an authorized service center or ask that you return your DARWIN to the factory. When returning an DARWIN to the factory, you will be issued a Return Merchandise Authorization number (RMA). Please label all cartons , shipping documents and correspondence with this number. E-mu suggests you carefully and securely pack your DARWIN for return to the factory. *(Do not send the power cord or operation manual.)* Mark the outside of the shipping carton clearly with your RMA number. Send to E-mu Systems, Inc. 1600 Green Hills Road, Scotts Valley, California, 95066. You must pre-pay shipping charges to E-mu Systems. E-mu will pay return shipping fees. You will be responsible for any damage or loss sustained during shipment in any direction.

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